## California High-Speed Train Project



## Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Geotechnical Data Report
Clinton Ave to East American Ave

Appendix B Exploratory Borehole Records



# **Appendix B Exploratory Borehole Records**

For gINT Database, see CD

 Table B-1

 Summary of Exploratory Borehole Locations, Depths, and In Situ Testing

Borehole ID	Elevation (NAVD88)	Northing (NAD83)	Easting (NAD83)	Continuous Sampling Interval(s)	Total Depth of Drilling	In Situ	Testing
	(ft)	(ft)	(ft)	(ft)	(ft)	PS <sup>[1]</sup>	PZ <sup>[2]</sup>
S0001R	287.40	2,162,577	6,318,315	5 to 15.5	51.5		
S0002R	290.40	2,158,798	6,322,192	5 to 15.5	81.5		
S0003R	288.00	2,157,251	6,323,233	5 to 15.5	82.0		✓
S0004R	283.70	2,156,593	6,324,256	5 to 15.5; 50 to 56	81.5		
S0005R	285.30	2,155,457	6,325,239	5 to 15.5; 45 to 51	95.0	✓	✓
S0006R	287.60	2,154,688	6,325,497	5 to 15.5; 35 to 41	81.5		
S0007R	285.10	2,152,087	6,327,474	5 to 15.5	81.5		
S0010R	286.10	2,150,922	6,328,342	5 to 15.5	165.0	✓	<b>✓</b>
S0012R	287.60	2,148,215	6,330,774	5 to 15.5	165.0	✓	
S0013AR	286.10	2,146,714	6,332,312	5 to 15.5	150.0		✓
S0014AR	285.40	2,143,960	6,334,724	5 to 15.5	81.5		
S0014R	284.60	2,145,253	6,333,705	5 to 15.5	81.5		
S0015R	286.70	2,141,424	6,337,012	5 to 15.5	51.5		
S0016R	288.80	2,138,780	6,338,686	None	160.0		✓
S0017R	290.50	2,136,102	6,340,038	None	151.5		✓
S0018R	305.80	2,134,428	6,340,369	None	165.0	✓	✓
S0019R	292.50	2,125,499	6,341,566	5 to 15.5	51.5		

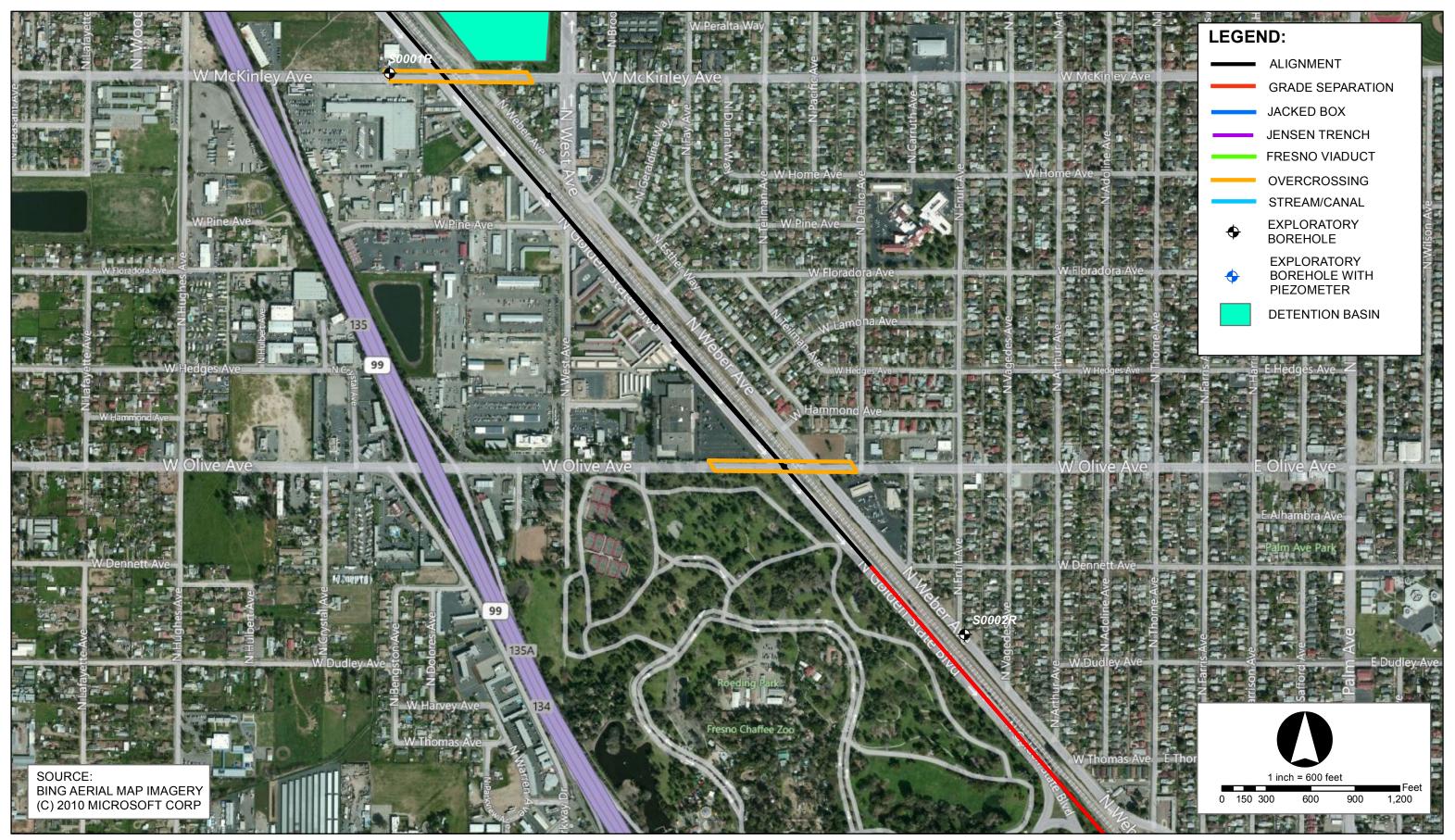
<sup>[1]</sup> PS: P- and s-wave suspension velocity logging

<sup>[2]</sup> PZ: standpipe piezometer



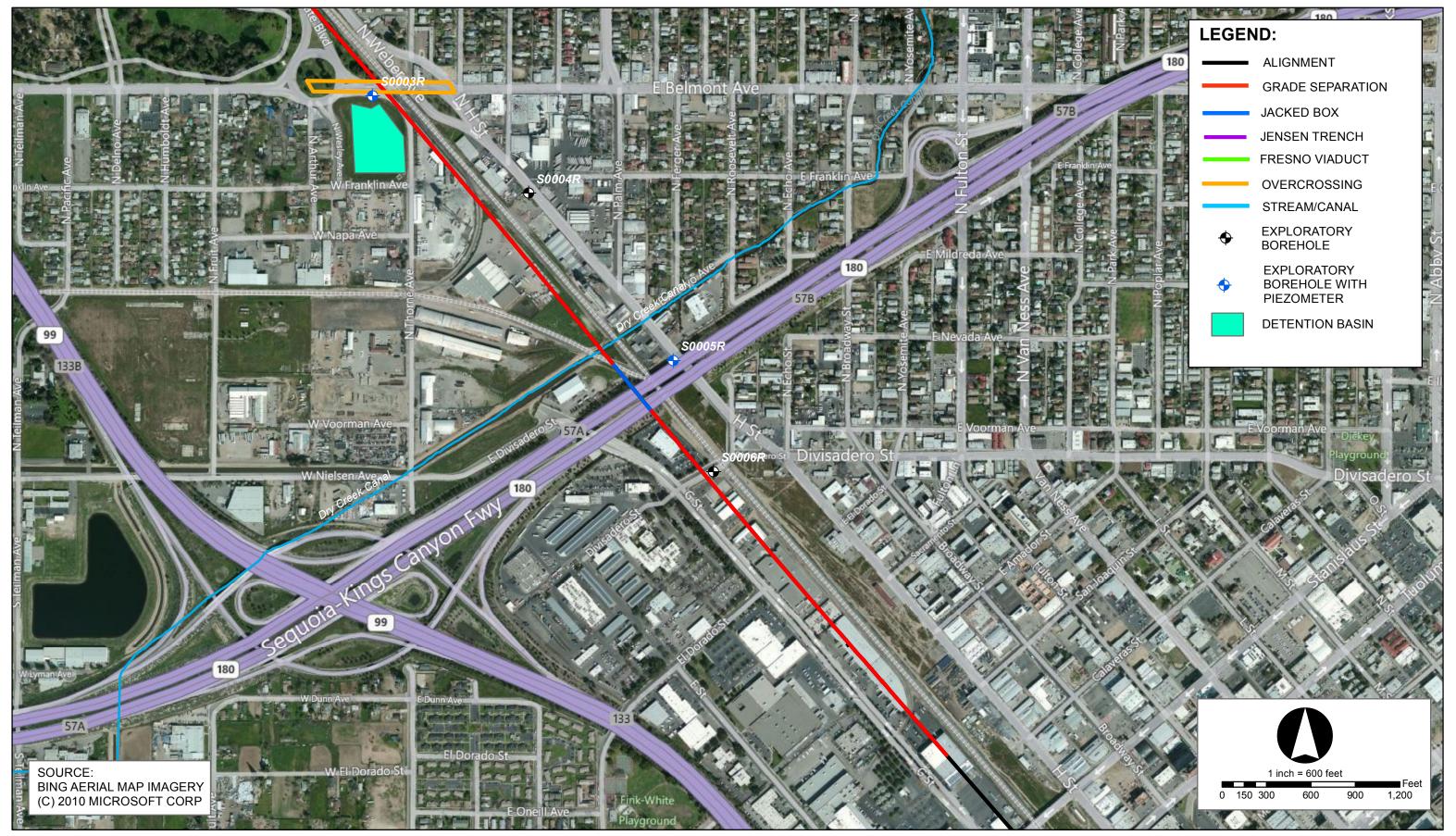






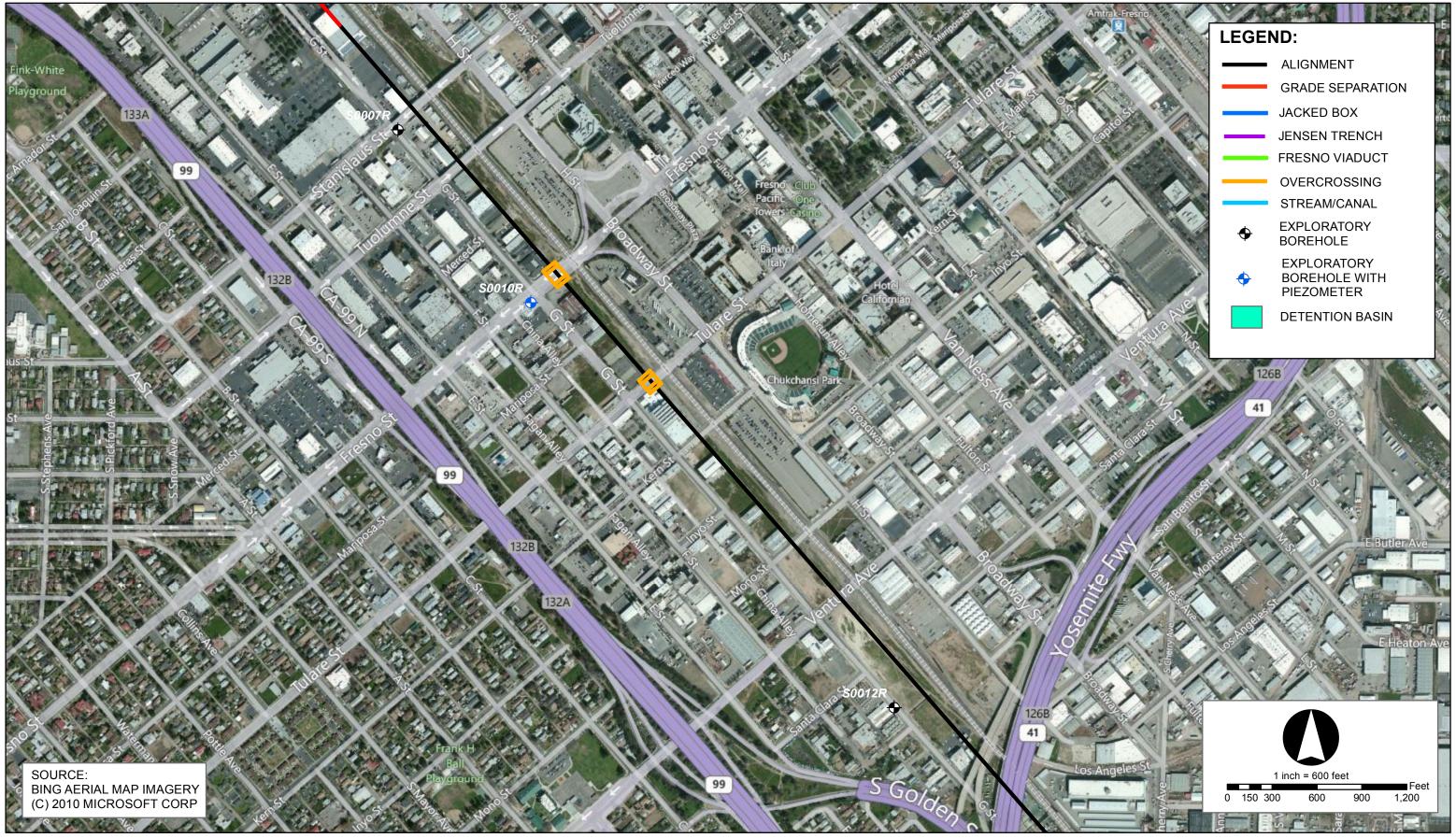








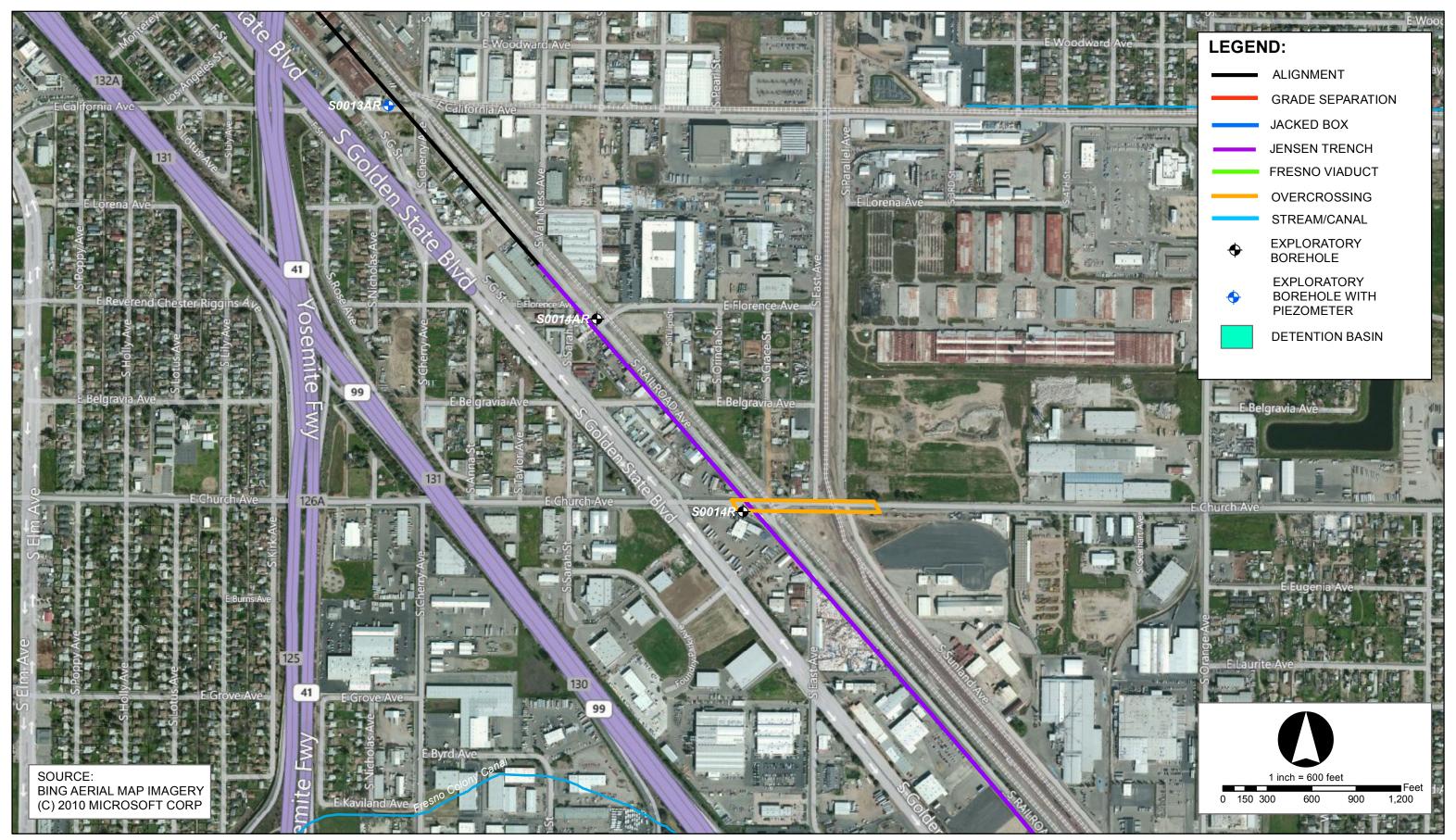








EXPLORATORY BOREHOLE LOCATION PLAN
California High Speed Train
Fresno to Bakersfield
Geotechnical Data Report - Package 1







EXPLORATORY BOREHOLE LOCATION PLAN
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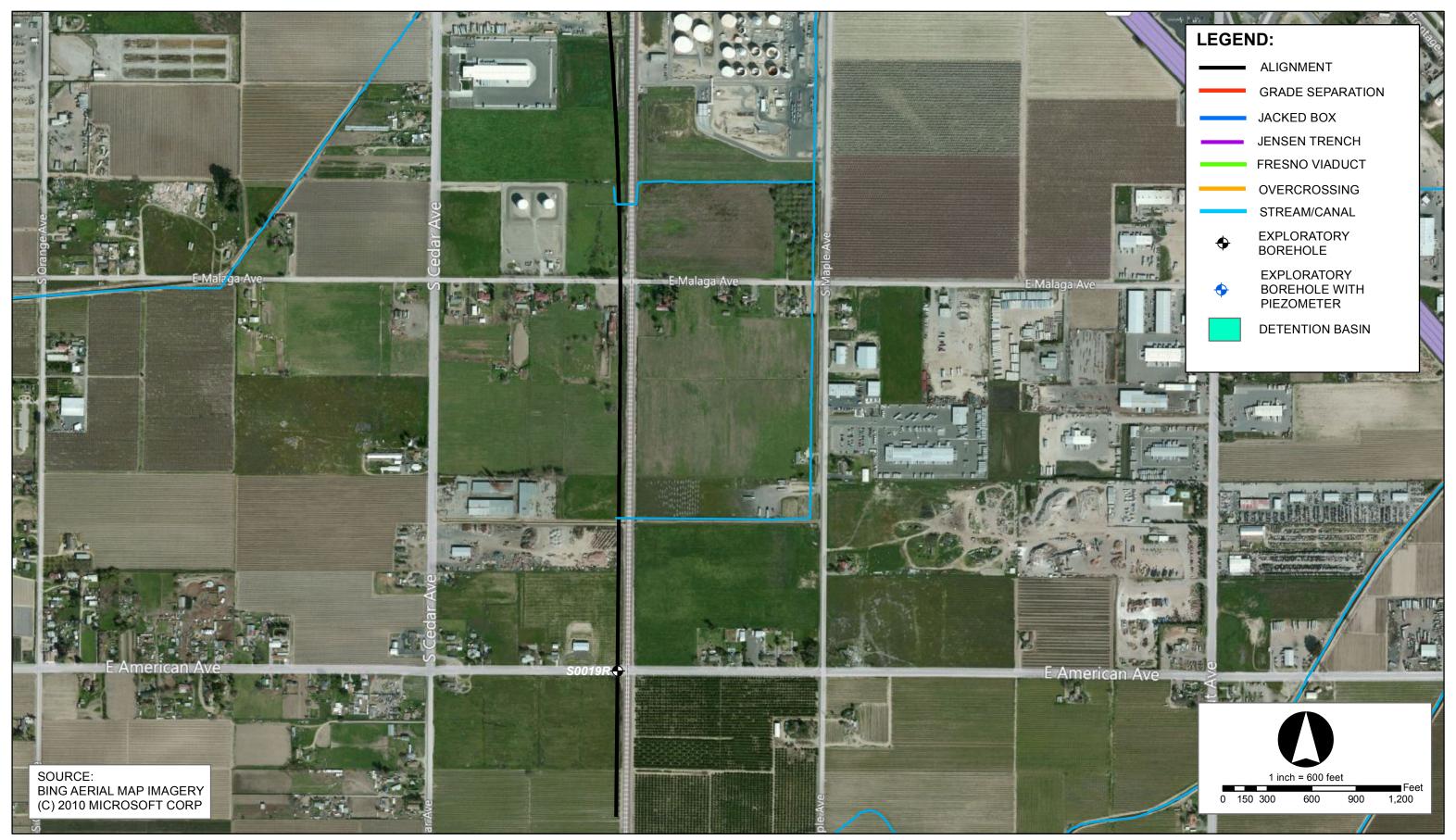












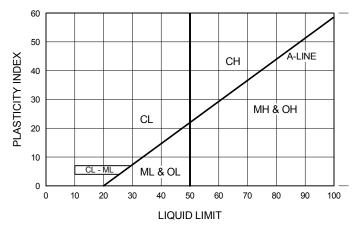




### **INDEXED SOIL CLASSIFICATIONS**

GRAPHIC	SYMBOL	DESCRIPTION		MAJOR DIV	SIONS	;	
	GW	WELL-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	CLEAN GRAVELS	: OF IN IS 0.4	MAY BE SIZE		
	GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	(LITTLE OR NO FINES)	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO.4 SIEVE SIZE	FOR VISUAL CLASSIFICATION, THE 1/4" SIZE MAY USED AS EQUIVALENT TO THE NO.4 SIEVE SIZE	S S S S S S S S S S S S S S S S S S S	
	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	GRAVELS WITH FINES	GRAVEL: RE THAN HARESE FRACT RGER THAN SIEVE SIZE	HE 1/4".	COARSE-GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO.200 SIEVE SIZE	
	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES	( APPRECIABLE AMOUNT OF FINES )	MOI COA	10N, 1	AINEC - OF M/ D.200 S	THE
*****	SW	WELL-GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES	CLEAN SANDS	- OF N IS 10.4	SIFICAT	E-GR IN HALF	THE NO.200 U.S. STANDARD SIEVE IS ABOUT SMALLEST PARTICLE VISIBLE TO THE NAKED
	SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES	(LITTLE OR NO FINES)	SANDS THAN HALF SE FRACTION ER THAN NC IEVE SIZE	CLASS	OARS RETHA	VE IS A
	SM	SILTY SANDS, SAND-SILT MIXTURES	SANDS WITH FINES	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO.4 SIEVE SIZE	VISUAL ED AS	OPE	RD SIE
	SC	CLAYEY SANDS, SAND-CLAY MIXTURES	( APPRECIABLE AMOUNT OF FINES )	MORE SMALL	FOR		TANDA
	ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY				L IS	0 U.S. S PARTIC
	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS		& CLAYS LESS THAN 50		SOILS MATERIA SIEVE S	NO.20
	OL	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY				NED S - OF M/	THE
	МН	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF HIGH PLASTICITY				FINE-GRAINED RE THAN HALF OF N LLER THAN NO.200	
	СН	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS		& CLAYS REATER THAN 5	0	FINE-GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO.200 SIEVE SIZE	
	ОН	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS				MO SMA	
7 77 7	PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	Ніс	GHLY ORGAN	NIC SOI	LS	
	os	OILY SEDIMENTS					





#### **KEY TO TEST DATA**

TV = POCKET TORVANE
PP = POCKET PENETROMETER

#### **KEY TO SAMPLER TYPE**

BULK

SPT = STANDARD PENETRATION TEST SAMPLER





SOIL CLASSIFICATION CHART AND KEY TO TEST DATA

	=CT NA <b>forni</b> a		h-Speed Train Fresno to Bakersfield													- 1	1 <b>315</b> 7		JMBER 1 <b>0</b>	
LOGG	ED BY oling		BEGIN DATE COMPLETION DATE Oct-10-11 Oct-11-11					ION (Lat / E631								- 1	OLE 10		2	
DRILL	ING CC		ACTOR/DRILLER	IN-SIT							- (.		0	/		SL	JRFA	CE EI	LEVATION	
	ner/O. ING ME			DRILL	RIG											_			(NAVD88) DIAMETER	
AUG	SER(0	'-14')	, MUD ROTARY(14'-51.5')	Faili	ng 1											4	.875	in		
	LER TY (1-3/8		AND SIZE(S) (ID)	1				E/HAMM Ibs, 30			ор						AMME 88%	REF	FICIENCY, ER	ti
BORE	HOLE I	BACKE	FILL AND COMPLETION		INDW	/ATE	RI	DURING	DRIL	LING	•			LING (	DATE	) TO	OTAL		TH OF BORING	3
Nea	t cem	ent g	rout	KLAD	INGS		13	3.5 ft (10	/10/20	11)		N	ot Rec	orded		5	1.5 f	t 		
Elevation (ft)	Depth (ft)	Material Graphics			ole Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	r Strength (tsf)	Drilling Method	o Ceptil	
Elevi	Dept	Mate	Description		Sample	Samp	Samp	Blow	N-Va	Pene	Reco	200 \	Moist	Liqui	Plast	Orga	Shear	Drillir	Remarks/ Other Test	
	0 =		ASPHALT (4") (AC). SILTY SAND (SM); brown; moist to dry; fine; trace	e fine		01	0			60	60							}	Hand auger to 5.0'	
			subangular GRAVEL; trace SILT; [FILĹ].		200000000000							31.9						~~~~~	Modified Proct Max $\gamma_d$ = 136. pcf Optimum W <sub>i</sub> = 6.4%	.6
	_		SILTY SAND (SM); medium dense; brown; moist dry; fine to medium; little fines; weak cementation [ALLUVIUM].		000		5													
282.44	5		[ALLOVIONI].		S	02	5 3	33-16-16	32	18	6							}		E
						6	6.5													
	=				\s\s	03 6	3.5 1	10-11-14	25	18	18									
	₫				$\mathbb{N}$		8					21.2								
			Poorly graded SAND with SILT (SP-SM); brown; r to dry; fine; few SILT; weak cementation.	moist	s		8 1	10-10-10	20	18	18	8.7						  } 	Installed 8.5' o casing	of 5"
277.44	10		9.5', grades to reddish brown; moist; some SILT.		s	05 9	9.5	9-7-7	14	18	18							<b>}</b>		
			10.5', grades yellowish brown; trace fines.  SANDY SILT (ML); very stiff; reddish brown; wet; SAND; weak cementation.	some	s	06 1	11 1	16-11-12	23	18	18	69.4								
					Δ.		2.5													
	=		SILTY SAND (SM); dense; light yellowish brown; to dry; fine; some SILT; weak cementation.	moist	Ms	507 12	2.5 1	19-23-17	40	18	18							$\left \left \left \right \right $		
	<u> </u>		44.01 marking days by the second				14	2 / 11	40	10	40	32.4							Driller measure water level at	es =
070	45		14.0', medium dense; brown; wet; subangular GRAVEL; fine to coarse; occasional wood debris.		$\mathbb{N}^{s}$			3-4-14	18	18	18	05.5							13.5' Switch to mud rotary at 14.0'	E
272.44	15-				Д	1	5.5					35.2							(4.875" tricone bit)	•
272.44	=																			
																				E
-267.44	_20		(cont. B																	
			(continued)				PE	PORT 1	TITI F										HOLE ID	
								ORING	3 RE	CO		DO	UTE	-	OSTN	/II E		;	S0001R A	
		<b>^</b> ^		ARI IP									UIE		USIN	'IILE			EA .	
		Aر.	LIFORNIA Speed Rail Authority				Ca	ROJECT aliforn	ia Hi	gh-	Spe	ed T								
207.44	Н	ıgn-	opeea kali Authority	H-SPEED TH	AN		BR	RIDGE N	UMBE	R		REPAR . Ma		Y . Cu	rran		DA <sup>2</sup>	TE 20-1	SHEET 1 of	3

DRILLING CONT PITCHER/O. E: DRILLING METH AUGER(0'-1 SAMPLER TYPE SPT(1-3/8") BOREHOLE BAC Neat cement	Igh-Speed Train Fresno to Bakersfield  BEGIN DATE COMPLETION DATE Oct-10-11 Oct-11-11  RACTOR/DRILLER spinosa  OD 4'), MUD ROTARY(14'-51.5')  (S) AND SIZE(S) (ID)  EXFILL AND COMPLETION grout	N210 IN-SITE DRILL Failin SPT H. Auto	RIG ng 1 AMM ma	1500 MER tic,	132 NG 0 TYP 140 ER	PE/HAMM D lbs, 30 DURING 13.5 ft (10.	ER ID	n dro	) (N	lation	DRIL ot Rec	rid)		SI 22 B0 24 H.	13157 OLE II SOO( JRFAG 287.4 DREH 1.875 AMME 68% DTAL I	77-00 ) )1R )CE ELE 4 ft (N )OLE D in R EFF	EVATION NAVD88) IAMETER ICIENCY, ERI	
Elevation (ft)	-			_	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
262.44 25	SANDY SILT (ML); hard; dark yellowish brown wit mottled red; wet; some SAND; low plasticity; weak cementation.  SANDY SILTY CLAY (CL-ML); hard; brown; wet;	<b>.</b>	X	2	21.5	18-36-39	75	18	16	63.7		21	3	1.4		1000000000000000000000000000000000000		
257.44 30	fine SAND.		X	2	26.5					50.7	13.1	18	4	2.4		000000000000000000000000000000000000000		
	SILTY SAND (SM); dense; dark yellowish brown; fine to medium; little SILT; weak cementation.	wet;			30	18-16-20	36	18	16	28.9						$\sim$		
252.44 35	SILTY SAND (SM); dense; mottled grayish brown reddish brown; wet; fine; little SILT; weak cementate Poorly-graded SAND (SP); dense; mottled grayish brown and reddish brown; wet; fine; trace SILT; we cementation.	ation/ n	S		35	26-25-24	49	18	12							000000000000000000000000000000000000000		
247.44—40	(continued)																	_
C/ Hig	ALIFORNIA h-Speed Rail Authority	ARUP H-SPEED TR	AN		B D P C	EPORT T BORING IST. ROJECT Californi RIDGE N	COU OR B	RIDG gh-S	Spe	AME	RED B	Y	POSTM		DA:	S EA	SHEET	

PROJECT NA California		-Speed Train Fre	sno to Bakersfield	I														T NUM 7 <b>7-00</b>	1BER	
LOGGED BY A. Poling	· · · · · · · · · · · ·	BEGIN DATE Oct-10-11	COMPLETION DATE Oct-11-11	BORE				TION (Lat 2 / E631								Н	OLE 10	)		
		TOR/DRILLER	000 11 11	IN-SIT				. , _001	5510		, (1)		.u. U	)		SU	JRFA	CE ELE	VATION	_
DRILLING ME	-	usa		DRILL	. RIG	<del></del>													IAVD88) AMETER	
		MUD ROTARY(14	'-51.5')	Fail													.875			
SAMPLER TY SPT(1-3/8		ND SIZE(S) (ID)		- 1				PE/HAMM Dibs, 30			р						AMME 38%	REFFI	CIENCY, ERI	
BOREHOLE E	BACKFIL	L AND COMPLETION		GROU READ	JND\	WAT		DURING			Α				(DATE				OF BORING	
Neat ceme	ent gro	ut		READ	ING	3		13.5 ft (10	/10/20	11)		N	ot Rec	orded		5	1.5 f	<u>t</u>		$\neg$
Elevation (ft) Depth (ft)	Material Graphics		Opposition.		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/	
40 —			Description les to medium grained; wi	ithout	_	ഗ് S13	ഗ് 40	<u>m</u> 21-17-24	<b>2</b> 41	18	14	7(	Σ		<u> </u>	0	<u>N</u>	_	Other Tests	$\dashv$
		reddish brown mottling			X		41.5					0.1						000000000000000000000000000000000000000		
42.44 45			d; grayish brown with redo ace SAND; low to medium tation.			S14	45 46.5	8-15-50	65	18	18	97.2	31.9	37	14	2.9		000000000000000000000000000000000000000		
237.44 50			); hard; grayish brown with mottling; wet; fine; trace		M	S15	50	28-31-47	78	18	15									
1 =		SAND; low plasticity.	<b>G</b> , , ,		Δ		51.5					90.2	22.8	26	5	1.2				
232.44 555	:	For corrosion test results of the control of the co	as "wet" because SPT sa rieval through rotary meth ure indication should not of a potential phreatic surf	amples nod be face or																,
227.44—60		See Borenole Log Legt	end for soil classification of disampler type.	urart																
																		1.		_
<u>~</u> (	١٨:	IFORNIA	URS HMM	ARUP			D	BORING	COL	INTY			UTE	F	POSTN	ИILE			LE ID 0001R	_
	AL.	Deed Rail Autho	1	trau Course				ROJECT	ia Hi	gh-S	Spe	ed T					T -		12	
П	1911-3	Jeeu Kuli AUII10	The state of the s	and the same of	- certif		B	RIDGE N	UMBE	:R		REPAR . Ma			ırran		DA <sup>2</sup>	TE 20-12	SHEET 3 of 3	

Califo	T NAME	h-Speed Train Fre	esno to Bakersf	ield	DELLO	N. F. I	004	TION! /!	1.0		11- /	<b>-</b>		1		_   1	315	77-00	MBER )
	odenow	BEGIN DATE Oct-12-11	COMPLETION DA	N	2158	798	.327	TION (La 7 / E632								3		)2R	
	G CONTRA I/D. Selde	CTOR/DRILLER ers		IN-	SITU	TEST	ING												EVATION NAVD88)
	G METHOD	) ), ROTARY(5.5'-81	5')	I	ILL RI lobil l		)										OREH 3.75 i		DIAMETER
SAMPLE	R TYPE(S)	AND SIZE(S) (ID)	,	SP	T HAN	/MEF	RTYF	PE/HAMN								H	AMME		FICIENCY, ERI
SPT(1		FILL AND COMPLETION	N					DURING			•	AFTER	R DRIL	LING	(DATE		38% OTAL	DEPT	H OF BORING
Neat c	ement gi	rout		RE	ADING	SS		Not Re	ecorde	d I		N	ot Rec	orded			31.5 f	t	I
Elevation (ft)	Depth (ft) Material Graphics		Description		Sample Location		Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
		ASPHALT (6") (AC).  AGGREGATE BASE (	(6") (AB).		200	S01	0			60	60							{	
		SILTY SAND (SM); re SILT; trace GRAVEL;	ddish brown; moist; fi	ine; little ].								23.8						\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
285.41	5			moist: fine		S02	5	3-3-4	7	18	16	-						{{	5.0', Began usin
		1 Dony graded SAND (	or ,, reduisir browil, f	noist, iiile.	$ \rangle$	502		J-J-4	'	13	10	19.5	3.9					1	mud rotary
	3	SILTY SAND (SM); ve	ery dense; reddish bro	own; moist:		S03	6.5	4-25-47	72	18	16	-						))()()	
		Poorly graded SAND v reddish brown; moist; SILTY SAND (SM); ve	with SILT (SP-SM); ve fine; few SILT.	ery dense;	-1X	S04	8	29-52-50		16	16	_							
		to wet; fine; some SIL	т.		X	005	9.5	36-43-22	9.75"	18	16	42.3/	10.5					00000	
280.41 1	0 -	fine; little SILT.	ery dense, readish bro	own, wet,	X	303	11	30-43-22	05	10	10	29	15.1					MMM	
		11.0', grades brown.  Becomes less cement	ed. Cementation end	ds at 11.9'.	X	S06	11 12.5	8-16-41	57	18	13							( )	
		Calcite seams end.  Poorly-graded SAND (brown; wet; fine to me cementation.	(SP); medium dense; dium; trace SILT; wea	— — — — grayish ak		S07	12.5	12-15-13	28	18	13	_						MANNA	
275.41 1	5—	Calcite seams in the to 14.0', grades mostly n white calcite seams; p	nedium-grained; subro		X	S08	14	6-7-10	17	18	14	2.8	_					100000000	
270.41—2																		000000000000000000000000000000000000000	
0 1—2		(continu	ed)																
							E	REPORT BORING DIST.	Ģ RE	CO JNTY			UTE	F	POSTN	/IILE			OLE ID 60002R A
		LIFORNIA Speed Rail Autho		ORNIA HIGH- SPE	ED TRAN			PROJECT Californ BRIDGE N	nia H	gh-	Spe	ed T	rain RED B	Y			DA	TF	SHEET

DRILL AUC SAMP BORE	GED BY Goode ING CO gg/D. ING ME GER(0 PLER TY	A High NONTRA Selde THOE '-5.5' 'PE(S) BACKF	AND SIZE(S) (ID)	N21 IN-SIT DRILL Mob	S87 UT RIC Sil B	798. ESTI 3-80 MER atic,	.327 ING R TYF	TION (Lat 7 / E632 PE/HAMM ) Ibs, 30 DURING Not Re	ER ID	n dro	) (N	lation	DRILL ot Rec	rid)		11 HG S SU 2 2 BG 3 H/ 8 E) T C E) T C	290.4 DREH 3.75 i AMME 38% DTAL I 31.5 f	77-00 ) )2R DE ELI 1 ft (I OLE D n R EFF	
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
265.41	25		Poorly graded SAND (SP); dense; grayish brown fine; few SILT; weak cementation.  SILTY SAND (SM); medium dense; grayish brown		X	S09 S10	21.5	21-18-14	32	18	14	3.5	14.8					1000000000000000000000000000000000000	
260.41	30		fine to coarse; little SILT; weak cementation.  SILTY SAND (SM); dense; olive brown; wet; fine:		X		26.5	18-21-21	42	18	16	15.7						000000000000000000000000000000000000000	29.0', mud rotary is much harder to drill
255.41	35		SILT; weak cementation; frequent reddish brown oxidation partings.  SILT (ML); stiff to hard; olive brown; wet; fine; fev		X	S12	31.5	16-24-36	60	18	17	43.5/ 45.6	15					<u> </u>	PP: 1.25 tsf
255.41	40		SILT (ML); stiff to hard, onlive brown; wet; fine; fet SAND; low plasticity.	IV.			36.5	10-24-30	50	10	17	86.4	28.6	32	3	2.2		000000000000000000000000000000000000000	PP: 1.25 tsf TV: 1.2 tsf
200.41			(continued)				T-											1	
20.41	H	CA igh-	LIFORNIA Speed Rail Authority	ARUP	RAN		E F (	REPORT TO BORING PROJECT Californ BRIDGE N	COL OR B	RIDG gh-S	Spe	AME	RED B	Y	POSTM		DA:		

Cali	i <b>fornia</b> SED BY		h-Speed Train Fres	no to Bakersfield COMPLETION DATE	   ROPE	:HOi	IF!	OC <sub>V</sub>	TION (La	t/Long	or N	orth/	Fact o	nd Da	tum\		_   1	1315 OLE II	77-00	) )	
N. C	Goode		Oct-12-11	Oct-13-11	N21	587	798	.327	7 / E632								3	3000	)2R		
	ING CC gg/D. :		ACTOR/DRILLER ers		IN-SIT	UT	EST	ING												EVATION NAVD88)	
DRILL	ING ME	THOE	)	D.	DRILL												В	OREH	OLE [	DIAMETER	
			), ROTARY(5.5'-81.5 ) AND SIZE(S) (ID)	·)	Mob SPT F				PE/HAMIV	ER IC	)							3.75 i AMME		FICIENCY, ERI	
SPT	(1-3/8	") `	, , , ,		- 1				) lbs, 30			-					3	38%			
	HOLE E		FILL AND COMPLETION rout		GROU   READ			ΓER	DURING Not Re			; A		DRIL ot Rec		(DATE		отаl 31.5 f		H OF BORING	
Elevation (ft)	Depth (ft)	Material Graphics				ole Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	r Strength (tsf)	Drilling Method Casing Depth		
Eleva	Dept	Mate	De	escription		Sample	Samp	Samp	Blows	N-Val	Pene	Reco	200 V	Moist	Liquic	Plasti	Orgai	Shear	Drilling N	Remarks/ Other Tests	
	<b>-</b> 40		SANDY SILTY CLAY (Cl wet; some fine SAND; tra	L-ML); very stiff to hard; ace coarse SAND: low	brown;	M	S13	40	12-13-24	37	18	16							_	PP: 2.5 tsf TV: 2.1 tsf	Ī
245.41	45		plasticity; slow dilatancy.		_ — — —		S14	41.5	15-22-25	47	18	17	52	16.5	22	7	2.1		<u>0000000000000000000000000000000000000</u>		
	₫		SAND; no plasticity; slow trace organics; frequent	dilatancy; weak cemen	ntation;	X		46.5					81.7	29.2/			2.4			Atterberg Limits:	
240.41	50		reddish brown partings.				S15	50	19-22-17	39	18	16		27.9							
	₫		SANDY SII T (MI ): bord	olivo brown: wot: fino:		- X		51.5													
SRARY.GLB 2/20/12 55 15 15	55		SANDY SILT (ML); hard SAND; weak cementatio pockets of oxidation.	n; frequent reddish brov	wn				40.00.00		10	-10	65.7	29.8					$\sim$		
F-B CHSR_F-B.GPJ ARUP DOTR LIB	-60		Poorly-graded SAND (Sf wet; fine; trace SILT; low frequent reddish brown s	dilatancy; weak cemen		X	S16	55 56.5	19-26-28	54	18	18							000000000000000000000000000000000000000		
HST.			(continued	)																	
)-90									EPORT S		CO	RD								OLE ID 60002R	
0.3 BOREHOLE LOG - CHSTP									IST.	COL	JNTY		RO	UTE	F	POST	ΛILE		E	Α	
REH SE		A	LIFORNIA	URS HMM	ARUP				ROJECT					rain							
0.3 BC	H	igh-	Speed Rail Authori	T CALFORNA H	HIGH- SPEED TO	RAN			RIDGE N			PF	REPAR	RED B		ırran		DA	TE 20-1	SHEET 2 3 of 5	
← L												ע⊥	. ivid	ggi/T	. UU	ıııdıl		Z-,	۱ −∪ے	<u> </u>	

Cali LOGG N. C DRILL Gre DRILL AUC SAMP SPT BORE	GED BY Goode ING CO gg/D. ING MI GER(O PLER T	now ONTRA Selde ETHOL O'-5.5' YPE(S) BACKF ent g	), ROTARY(5.5'-81.5') I AND SIZE(S) (ID)	N21 IN-SIT  DRILL Mob SPT H Auto	RIG DII B IAMI	798. EST 3-80 MER atic, WAT	.327 ING R TYF 140	TION (La 7 / E632 PE/HAMM ) Ibs, 30 DURING Not Re	2192 MER ID D-incl	2.091	(N	lation FTER N	DRIL	LING orded	(DATE	11 HG SI 22 BG 3 H/ 8 E) TG	1315 OLE II SOO( JRFA( 290.4 DREH 3.75 i AMME 38% DTAL 31.5 f	D2R DE ELE 1 ft (N OLE DI N R EFFI		
Elevation (ft)	Depth (ft)	Material Graphics	Description			Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
225.41	65		SILTY SAND (SM); very dense; reddish brown; w fine; some SILT; frequent interbedded layers of gr brown SILT; no cementation.  66.2', olive brown; some fine SAND; trace coarse SAND; weak cementation.	rayish		S18	60 61.5 65 66.5	21-50	50/ 5"	11	11	49.3	12.5					1000000000000000000000000000000000000		
220.41	=		SILT with SAND (ML); hard; olive brown; wet; few coarse SAND; low plasticity; weak cementation.	,		S19	70 71.5	18-43-57	100	18	18	82.4	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	31	7	3.3				
215.41	75		Poorly-graded SAND (SP); dense; grayish brown; fine; trace fines; rapid dilatancy; weak cementatio			S20	75 76.5	14-18-21	39	18	18							<u> </u>		
<b>-</b> 210.41	<b>-</b> 80	r ar	(continued)													I				
2 10.411	) (	CA ligh-	LIFORNIA Speed Rail Authority	ARUP H-SPEED TH	RAN		D P	REPORT BORING BO	COL COL OR B	RIDG	E N/ Spe	AME ed T	RED B	Y	POSTM	ИILE	DA 2-:	S(	SHEET	

PROJE Cali			h-Speed Train	Fresno t	to Bakersfield														3157		MBER )	
LOGG		_	BEGIN DATE Oct-12-1	E COM	MPLETION DATE					TION (Lat								HC	DLE ID	)		
			ACTOR/DRILLER	1 00	νι-10-11	IN-SIT				/ =032	∠ 19Z	.U <del>U</del> I	(17	auun	iai Gl	iu)			JRFAC		EVATION	—
Gre	gg/D.	Selde	ers															2	90.4	1 ft (	NAVD88)	
	NG ME		), ROTARY(5.5'	'-81 5'\		DRILL						-							)REH		DIAMETER	
			) AND SIZE(S) (ID)	01.0)					ГҮР	PE/HAMM	ER ID							_			FICIENCY, EI	Ri
	(1-3/8									) lbs, 30			-						88%			
	HOLE E		FILL AND COMPLET	TION		GROU READ			R	DURING Not Re			A	FTER No	DRILI ot Rec		DATE	′ I	1.5 f		H OF BORIN	G
																	_					
		soic					no	E G	€			<u></u>			Moisture Content (%)	9	Plasticity Index (%)		Shear Strength (tsf)			
(ff)		Grap					-ocat		Je ptr	per 6 in.	(bl/ft)	on (ir	(in)	h (%)	Cont	mit (%	Inde	(%)	rengt	letho epth		
Elevation (ft)	Depth (ft)	Material Graphics					Sample Location	Sample Number	Sample Depth (ft)	ed s/	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	sture	Liquid Limit (%)	ticity	Organics (%)	ar St	Drilling Method Casing Depth		,
Ele	Dep	Mate		Descrip			San	San		Blows	N-V	Pen	Rec	200	Mois	Liqu	Plas	Orga	She	Drilli	Remarks Other Tes	
	-00		SANDY SILT (ML) SAND.	.); hard; gray	ish brown; wet; son	ne fine	W	321 8	30	16-23-41	64	18	17	65.4						M		
	=						$\mathbb{N}$	8-	1.5													
	∄		Borehole terminat	ted at a dept	th of 81.5' on 10/13/	2011.																1
	∃		For corrosion test	results, see	Appendix E.																	
	85				et" because SPT sai																	
	Ξ		drilling fluid. Soil	moisture ind	lication should not b	e																
	Ξ		free groundwater		ential phreatic surfa	ice oi																
205.41	85=		Soo Porobolo Log	. Logond for	soil classification cl	oort																
	∃		and key to test da			lait																
	Ξ																					
	Ξ																					
	=																					
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190.41	100																					
																				-		
										EPORT 1 SORING		CO	RD								DLE ID 0002R	
										IST.	COU			ROL	JTE	Р	OSTN	1ILE		E		
	<b>(</b>	A	LIFORNI	Α	URS HMM	ARUP			PF	ROJECT	OR B	RIDG	E NA	ME_	roin							
			Speed Rail Au		CALFORNIA HO	PH-SPEED T	RAN			Californ RIDGE N			PR	REPAR	ED B				DA	ΤE	SHEET	
			-											. Mag			rran		2-2	TE 20-1:	2 5 of	5

Calif	CT NAME	gh-Speed Train Fre	esno to Bakersfield	l											<u> </u>	1315	77-0	MBER )
A. Po	oling	BEGIN DATE Oct-12-11	COMPLETION DATE Oct-13-11	N2	1572	50.7	CATION (L 73 / E63									OLE 10 <b>S00</b> (	03R	EVATION
Pitch	er/O. Esp			IN-SI <sup>-</sup> Sta			G iezomete	er							:	287.9	8 ft (	NAVD88)
	NG METHO	DD , ROTARY(5'-82')		DRILI Fail	RIG											OREH 4.875		DIAMETER
SAMPL	ER TYPE(S	S) AND SIZE(S) (ID)		SPT I	HAMN	1ER T	YPE/HAM								Н	AMME		FICIENCY, ERI
	(1-3/8") HOLE BACK	KFILL AND COMPLETION	I	GRO	UNDV	/ATE	40 lbs, 3			•	FTER	R DRIL	LING	(DATE		68% OTAL	DEPT	H OF BORING
Neat	cement (	grout		READ	DINGS		Not R	ecorde	d		N	ot Rec	orded		1	32 ft		I
Elevation (ft)	Depth (ft) Material Graphics		Description			Sample Number		N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	
		ASPHALT (5) (AC).  SILTY SAND (SM); bro subangular; trace GRA moderate cementation	VEL; little SILT; weak to		<u> </u>	601 (			60	60	24.1	_					\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Hand auger to 5.0'  Modified Proctor Max $\gamma_d$ = 136.7
282.98	5—	5.0' - 6.5', grades loose	e; weak cementation.		(0,0,0,0,0,0)	602 5		6	18	18								pcf Optimum W <sub>i</sub> = 6.4% Set-up for rotary drilling at 5.0'
		6.5' - 7.2', grades to m	edium; wet.		As	6.		17	18	18	_						MANN	using 4.875" tricone bit
		weak cementation; [AL	eddish brown; wet; fine; fe		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	604 8		50/ 6"	12	12	43.1/							
		9.0', grades to reddish brown.	brown mottled with grayis		/\ . 1 / s	9.	5 22-20-2	2 42	18	18	89.7							
277.98	10	some SAND; SILT; into medium plasticity; wea	ard; grayish brown; wet; finerbedded layers of SAND lak cementation.	; 		1	1 29-39-5	0 89/	18	18	58.3	18.5	28	12	3			
		SAND; low plasticity.	id, grayish brown, wet, iiii	ic, iittic		12	1.5	11.5"			69.4	24.7	32	6	1.9			
		Poorly graded SAND w	vith SILT (SP-SM); mediu	 m	-\\\\	12		18	18	17							MANA	
272.98	15		e; few SILT; weak´cement dark yellowish brown; me		S	15		23	18	14	10.2	_						
																	2000000000000000000000000000000000000	
67.98	20	(continue	ed)													1	Ø	
		, some					REPORT BORIN DIST.	IG RE				UTE	[	POSTN	MII F			OLE ID 80003R
	CA	LIFORNIA	URS HMM	ARUP			PROJEC Califor	T OR E	RIDG igh-	SE N.	AME ed T	rain		0011	****			
	rligh	-Speed Rail Autho	CALIFORNIA H	HIGH-SPEED T	TRAIN		BRIDGE	NUMBI	ER			RED B Iggi/T		ırran		DA 2-	TE 20-1	SHEET 2 1 of 5

<b>Cali</b> LOGG	ED BY		ph-Speed Train Fresno to Bakersfield  BEGIN DATE COMPLETION DATE  Oct-12-11 Oct-13-11					TION (Lat								H	<b>1315</b> OLE II	<b>77-00</b>	MBER )
DRILL	Poling ING CC her/O.		ACTOR/DRILLER	IN-SIT	U T	EST	ING	zometer		00	יו) פ	naliUl	iai G	iiu)		SI		CE ELI	EVATION NAVD88)
DRILL	ING ME	THO		DRILL Faili	RIC	3										В		OLE D	DIAMETER
SPT BORE	(1-3/8	BACKI	) AND SIZE(S) (ID)  FILL AND COMPLETION  rout	Auto	ma IND	atic, WA7	140	PE/HAMM DIbs, 30 DURING Not Re	)-incl	n dro	-		DRIL		(DATE	E) TO	68%		FICIENCY, ERI
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
	-20		SILT (ML); very stiff; grayish brown; wet; few fine SAND; low plasticity; weak cementation.			S09	20 21.5	5-10-6	16	18	13	91.2		24	1	1.3			
262.98	25		Poorly graded SAND with SILT (SP-SM); medium dense; brown and dark yellowish brown; wet; fine; SILT; weak cementation.			S10	25 26.5	9-11-12	23	18	17	8.7						<u> </u>	28.5', driller notes coarser sand
257.98	30-		30'-31' grades fine to coarse; subrounded.		X	S11	30	15-15-22	37	18	11	6.5						1 – I	
7 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	35		CLAYEY SILT (CL-ML); hard; grayish brown with reddish brown mottling; wet; fine; little SAND; low plasticity.			S12	35 36.5	33-45-48	93	18	14	88.3	23.8	28	6	2.3		<u> </u>	34.0', driller notes silt in cuttings
247.08	40																		
5			(continued)				1-	EDORT T	רודי ר									11/	DI E ID
247.90							E	REPORT T BORING DIST.	3 RE	CO INTY		RO	UTE	F	POST	MILE			0003R
	H	ZA igh-	LIFORNIA Speed Rail Authority	H-SPEED TR	RAN			ROJECT Californ	ia Hi	gh-	Spe	ed T	rain RED B	Y			DA	TE	SHEET
ò		•					-			••				Γ΄. Cu	ırran		2-2	20-12	2 2 of 5

<b>Cali</b> LOGG	ECT NA I <b>fornia</b> ED BY Poling		h-Speed Train Fresno to Bakersfield  BEGIN DATE COMPLETION DATE  Oct-12-11 Oct-13-11					TION (Lat 3 / E632								H			
Pitc DRILL	her/O.	Espi THOE	)	DRILL	ndp	ipe 3	Pie	zometer								B(	287.9 OREH	8 ft (1 OLE D	EVATION NAVD88) IAMETER
SAMP SPT BORE	LER TY (1-3/8	PE(S)	ROTARY(5'-82')  I AND SIZE(S) (ID)  FILL AND COMPLETION  rout	Auto	IAM oma	IMEF atic,	R TYF , 14(	PE/HAMM O Ibs, 30 DURING Not Re	)-inch	n dro	-	AFTER N	DRIL		(DATE	H. (	68%	R EFF	ICIENCY, ERI
Elevation (ft)	ծ Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
	-40		SANDY SILTY CLAY (CL-ML); hard; grayish brow with frequent reddish brown mottling; wet; low pla weak to moderate cementation.			S13	41.5	19-20-22	42	18	18	53.6	15.5	17	4	2.3		000000000000000000000000000000000000000	
242.98	45		Poorly graded SAND (SP); very dense; grayish br with layers of brown; wet; fine; trace fine SILT; we moderate cementation.	eak to		S14	45 46.5	15-21-42	63	18	18							<u> </u>	
237.98	50		Poorly graded SAND with SILT (SP-SM); very der grayish brown to dark yellowish brown.	nse;	X	S15	50	31-26-33	59	18	10	11.5						$\sim$ 1	
7-1-5.457 AAOP DOTA LIBRAART 6LB ZZZUTZ 735 - 8.557 AAOP DOTA LIBRAART 6LB ZZZUTZ	55	. 1 1 1	SILT (ML); hard; grayish brown with reddish mottl wet; fine; trace organics; low plasticity.	ing;		S16	55 56.5	35-39-50	89	18	16	85.7		22	3	1.9		<u> </u>	
227.98	<b>-6</b> U		(continued)																
0.3 BOREHOLE LOG - CHSIP	<b>&gt;</b> (	<b>~</b> ^		ARUP			E	REPORT 1 BORING DIST. PROJECT	COL	INTY			UTE	F	POSTI	MILE			0003R
1.0.3 BORE	Н	igh-	LIFORNIA Speed Rail Authority	H-SPEED TR	RAN			Californ BRIDGE N	ia Hi	gh-S	Spe PF	ed T REPAR ). Ma	RED B		ırran		DA <sup>2</sup>	TE 20-12	SHEET 3 of 5

	ECT NA fornia		h-Speed Train Fresno to Bakersfield													- 1		77-00	MBER I	
LOGG	ED BY	ııııg	BEGIN DATE COMPLETION DATE Oct-12-11 Oct-13-11					TION (Lat								Н	OLE ID	)		_
DRILL	ING CC		CTOR/DRILLER	IN-SIT	UT	EST	ING				, (IV	auUl	iai G	iiu)		SI	JRFA		EVATION	_
	ner/O. ING ME	-		Star		•	Piez	zometer	•									,	NAVD88) DIAMETER	
			ROTARY(5'-82')	Faili			00										1.875		MAINE LEK	
	LER TY (1-3/8		AND SIZE(S) (ID)					PE/HAMM D lbs, 30			n					- 1	AMME 38%	REF	ICIENCY, ERI	
			ILL AND COMPLETION	GROL	JND	WAT		DURING			•	FTER	RDRIL	LING	(DATE			DEPT	H OF BORING	
Nea	t ceme	ent gr	out	READ	ING	iS		Not Re	cordec			N	ot Rec	orded	ı	8	32 ft			_
		S			u	٦.	(ft)						Moisture Content (%)		(%)		(tsf)			
Œ		Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	. 6 in.	bl/ft)	Penetration (in)	(ii)	(%) ر	Conte	Liquid Limit (%)	Plasticity Index (%)	(%)	Shear Strength (tsf)	Drilling Method Casing Depth		
Elevation (ft)	Depth (ft)	erial (			ple L	nple ∿	nple □	Blows per 6 in.	N-Value (bl/ft)	etratio	Recovery (in)	200 Wash (%)	sture	id Lin	ticity	Organics (%)	ar Str	Drilling M Casing D	D d /	
Ше	Dec	Mate	Description		San							200	Mois	Lig	Plas	Org	She		Remarks/ Other Tests	
			SILTY CLAY (CL-ML); hard; grayish brown with rebrown mottling; wet; some fine SAND; low plastici	ed ty.	$\bigvee$	S17	60	44-32-37	69	18	18							<u> </u>		E
	$\equiv$		60.7', grades to reddish brown.		$\triangle$		61.5					50.7	18.6	21	5	3.4				Ē
	=																			
	∃																			E
																		<u> </u>		Ē
222.98	65		65.0', SAND grades coarse.		$\bigvee$	S18	65	33-50	50/	12	12									Ė
	Ξ				Δ		66.5		6"											-
	∃						00.0													F
																				Ē
	=																			Ė
	=																			Ė
247.00																				E
217.98	70		SILTY SAND (SM); very dense; grayish brown wit brown mottling; wet; fine; some SILT.	th	$\bigvee$	S19	70	31-38-50	88/ 12"	18	18							<u> </u>		Ē
	$\equiv$		<u> </u>		$\wedge$		71.5					41.7						<u>0000000000000000000000000000000000000</u>		
	∃																	>		
	$\exists$																	000		
	$\exists$																			F
	$\equiv$																			
212.98	75		SILT (ML); hard; grayish brown with reddish brow		1	S20	75	29-31-50	81/	17	16									E
	∃		mottling; wet; few fine SAND; no plasticity.		X				11"			91.6	29.5			1.8			Atterberg Limits:	Ė
	$\exists$		76.0', grades to grayish brown.		$\vdash$		76.5					01.0	20.0			1.0		<u> </u>	NP	Ė
	Ξ																			
	$\equiv$																			
	₫																	<u> </u>		Ė
207.98	-80		(continued)											I	<u> </u>	I				
			<u> </u>					REPORT											DLE ID	
								BORINO DIST.		CO INTY		RO	UTE	F	POST	ЛILE		S E/	0003R \	
<u></u>	<b>(</b>	Δ	IFORNIA QUESTIMMA	VRUP .			P	ROJECT	OR B	RIDG	E N	AME								
	H	igh-	Speed Rail Authority	H-SPEED TO	RAN			Californ BRIDGE N	ia Hi	gh-	Spe	ed T	rain RED B	Y			DA	TE	SHEET	
		J	,					DOL IV	OIVIDL	-1 1	D.	. Ma	ggi/1	Си	ırran		2-2	20-12	2 4 of 5	

	ECT NA		h-Speed Train Fre	sno to Bakersfie	əld														77-00		
LOGG	ED BY	ing	BEGIN DATE	COMPLETION DAT	TE BORI				TION (La								Н	DLE II	)		
	oling	NTRA	Oct-12-11 ACTOR/DRILLER	OCI-13-11	IN-SI				3 / E632	3232	008	) (1	lation	iai G	riu)		_		03R CE ELE	EVATION	
Pitcl	her/O.	Espi	inosa					Pie	zomete	r										NAVD88)	
	ING ME SER(0		) ROTARY(5'-82')		DRILI Fai			00										DREH 1.875		IAMETER	
SAMP	LER TY	PE(S)	AND SIZE(S) (ID)		SPT	HAM	1MEF	RTYF	PE/HAMM								H/	AMME		ICIENCY, ERI	
	(1-3/8		FILL AND COMPLETION		I				DURING			-	FTFR	DRILI	I ING (	ΊΔΤΕ		88%	DEPTH	OF BORING	
	t ceme				REAL				Not Re			, ,		t Rec		, , , , , ,		2 ft	DEI 11	TOT BOTTING	
														(%)		(%		St)			
l <sub>æ</sub>		Material Graphics				ation	mber	Sample Depth (ft)	. <u>:</u>	æ	(in)	<u>-</u>	(%	Moisture Content (%)	(%)	Plasticity Index (%)	(6)	Shear Strength (tsf)	면		
Elevation (ft)	Œ	al Gra				Sample Location	Sample Number	e De	per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	e C	Liquid Limit (%)	ity In	Organics (%)	Strer	Drilling Method Casing Depth		
Eleva	Depth (ft)	/ateri	г	Description		amp	amp	amp	Blows	I-Valu	eneti	Secov	W 00	Aoistu	iquid	lastic	rgan	hear	rilling asing	Remarks/ Other Tests	
	-80			occomption .		X	S21		50	50/	18	6	N			ш	0	0)	<del>/ -   -  </del>	Other rests	$\pm$
	=							81.5		0									0000000		
	Ξ																				
	Ξ		Borehole terminated at	a depth of 82.0' on 10	0/12/2011.																
	=		Reamed out hole with 5 piezometer. Installed s																		E
	=		10/13/2011.  For corrosion test result	ts soo Annondiy E																	
202.98	95		Soil moisture indicated		T samples																E
202.96	00 =		became wet during retr drilling fluid. Soil moisti	ieval through rotary m	nethod <sup>*</sup>																E
	85		used as an indication of free groundwater table.	f a potential phreatic s																	
	∃		See Borehole Log Lege		on chart																
	Ξ		and key to test data and	d sampler type.																	
	Ξ																				E
	$\equiv$																				
197.98	90-																				
	Ξ																				
	Ξ																				E
	-																				E
50/12	=																				
-B 2/2	₫																				
RY.G	$\exists$																				E
192.98	95-																				
00 TR	=																				
RUPL	∄																				
PJ A	=																				
P-B.G	=																				E
HSR	₫																				E
9 4 4 107 00	100-																				_E
187.984 9	100																				
1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY GLB 2/20/12									REPORT '			RD								DLE ID 0003R	
									IST.		INTY		ROL	JTE	Р	OSTN	/ILE		EA		
E C	<b>(</b>	A	LIFORNIA	URS HM	M ARUP			F	ROJECT	OR B	RIDG	E N/	ME_	!							
3 80			Speed Rail Author	rity CALFOR	NA HIGH-SPEED	TRAN			Californ BRIDGE N			PF	REPAR	ED B				DA	TE	SHEET	
-0.												D	. Ма	ggi/T	. Cu	rran		2-	20-12	2 5 of 5	

PROJE Calif	forni	a Hig	Ih-Speed Train Free	esno to Bakersfield	BORE	HOLE	LOCA	ATION (La	t/Long	ı or N	orth/	Fast a	nd Da	tum)			ROJE( <b>1315</b> OLE II	77-0	JMBER <b>0</b>
A. Po	oling NG CC	ONTRA	Oct-24-11 ACTOR/DRILLER	Oct-25-11	N21		2.75	1 / E632								SI	SOO	04F CE EI	EVATION
DRILLII		ETHO		81 5')	DRILL	RIG	500									В		OLE	(NAVD88) DIAMETER
SAMPL SPT(	ER TY (1-3/8 HOLE I	/PE(S B'') BACKI	) AND SIZE(S) (ID) FILL AND COMPLETION	•	SPT H	IAMME omatic	R TY c, 14	PE/HAMM 0 lbs, 30 DURINO Not Re	O-incl	LING	•		DRIL		(DATE	H. (	AMME 68%	DEPT	FICIENCY, ERI
Elevation (ft)	Depth (ft)	Material Graphics		Description		Sample Location Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Remarks/
			CONCRETE (12") (CF		nv: fine	50'0'0'		_	_	60	60		_	_	_			<b>[</b> ]	Hand auger/garbage barrel to 5.0'
			to medium SAND; wea	k cementation; [FILL].	, in ie	000000000						51.8						\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Modified Proctor Max $\gamma_d$ = 121 pcf Optimum $W_i$ = 12.2%
278.69	5		5.0' Grades to brown. SILTY SAND (SM); ve reddish layers; moist to [ALLUVIUM].	ry dense; reddish brown v o dry; fine to medium SAN	with ND;	S02	6.5	7-33-42	75	18	18							\{\{\}	
			SANDY SILT (ML); ha layers; moist to dry; tra SAND; low plasticity.	rd; reddish brown with broace fine GRAVEL; fine to rard; brown; moist to dry; lit	medium 	S03	8	20-41-50	10"	16	16	59.9	25.2	27	1	3.1	_		
273.69	10		9.1', grades to grayish SANDY CLAY (CL); ha fine SAND; trace medi plasticity; weak cemen	ard; grayish brown; dry; so um to coarse SAND; low	 ome	Sos	9.5 9.5 11	11-23-40	63	18	18	55.8	18.4	25	8	2.6	_		
			Poorly graded SAND v brown; moist to dry; fe trace coarse SAND; w 11.0', grades to grayis	with SILT (SP-SM); very downwith SILT; fine to medium S	AND;	S06		25-27-39	66	18	18	50.4	40.0	47		4.7			
			mottling; moist to dry; cementation.	rd; reddish brown with red some SAND; low plasticity CL-ML); very stiff; grayish	y; weak	So	7 12.5	11-12-10	22	18	13	65.4	10.3	17	4	2			
268.69	15		brown; moist to dry; so coarse SAND; low plas 13.1', grades to brown mottling; fine to mediu	ome fine SAND; trace med sticity; weak cementation. with occasional dark brow m SAND. ry stiff; grayish brown; mo	dium to wn	SOE	15.5	8-8-10	18	18	18	65.5	16.1	19	2	1.4	_		
263 60	30-																		
263.69┕	-20		(continue	ed)															
								REPORT BORINO DIST.	Ģ RE			RO	UTE	F	POSTN	MILE		5	IOLE ID S0004R A
	Н	CA ligh-	LIFORNIA Speed Rail Autho	URS I HMM	ARUP	RAN		PROJECT Californ BRIDGE N	ia H	igh-	Spe PF	ed T	RED B		ırran		DA 2-	TE 20-1	SHEET 2 1 of 5

DRILLING OF PITCHER TO SAMPLER TO SPT(1-3/BOREHOLE	ONTRAV. StelleTHOIO'-15.	D 5'), ROTARY(15.5'-81.5') ) AND SIZE(S) (ID)  FILL AND COMPLETION	N21 IN-SIT DRILL Faili SPT H Auto	RIC ng AM	EST 150 MER atic,	.751 ING 00 R TYF 140	TION (Lat I / E632 PE/HAMM O lbs, 30 DURING	ER ID	n dro	pp	AFTER	nal G	rid)	(DATE	11 HG S SU 22 BG 33 H/4 G S T C S T	13157 DLE IE 8000 283.6 DREH 3.875 AMME 58%	77-00 ) )4R )EE EL 9 ft ( ) OLE D in R EFF	
Elevation (ft)	Material Graphics to	Description	READI	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf) 6.1	Drilling Method Casing Depth	Remarks/ Other Tests
258.69 25		SILTY (ML); hard; grayish brown with frequent redebrown mottling; moist to wet; few SAND.  SILTY SAND (SM); dense; reddish brown; wet; lit SILT; fine to medium SAND; weak cementation.  SILT (ML); hard; grayish brown with reddish brown mottling; wet; some fine SAND.	ttle	X	S10	25 26.5	9-13-12	42	18	10	79	19.2					000000000000000000000000000000000000000	21.5', mud tub set 3.875 drag bit
253.69 30		SILTY SAND (SM); dense; brown; wet; some SIL weak cementation.  30.9', SILT lens; brown with reddish brown mottlir fine to medium SAND.		X	S11	30 31.5	18-20-16	36	18	17	\\\\28.4/ 82.8						$\sim$	
248.69 35 — — — — — — — — — — — — — — — — — —		35.0', grades to very dense; reddish brown.			S12	35 36.5	11-23-41	64	18	16	32.1						000000000000000000000000000000000000000	
1 -243.08 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40		(continued)																
POS EDOLE	CA High-	LIFORNIA Speed Rail Authority	ARUP	RAN		P	REPORT BORING DIST. PROJECT Californ BRIDGE N	COL OR B ia Hi	RIDG gh-S	SE N/	AME	RED B	Y	POSTM	/ILE	DA <sup>-</sup> 2-2		

DRILLIN Pitche DRILLIN AUGE SAMPLE	ornia ED BY Dling NG CO er/W. NG ME ER (0' ER TY 1-3/8	NTRA Stev THOD -15.5 PE(S) ") BACKF	S'), ROTARY(15.5'-81.5') AND SIZE(S) (ID) ILL AND COMPLETION	N21: IN-SIT	RIG ng AMI	EST 150 MEF atic, WAT	.751 ING 00 R TYF 140	TION (Lat I / E632 PE/HAMM O lbs, 30 DURING Not Rec	ER ID	n dro	pp	AFTER	DRILL ot Rec	LING orded	(%)	11 HG S SU 22 BG 33 H/4 GE) TG	13157 OLE IE SOO( JRFAC 283.6 DREHC 3.875 AMME 68% DTAL I	OAR OE ELE OILE D in REFF		
Elevation (ft)	Depth (ft)	Material Graphics	Description			Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
238.69	45		SANDY SILTY (ML); hard; grayish brown; wet; fine; some SAND.  SANDY SILTY CLAY (CL-ML); hard; grayish brow		X	S13	41.5	9-17-19	50/	18	12	63.4						0.00000000000000000000000000000000000		
233.69	50		SANDY SILTY CLAY (CL-ML); nard; grayish brow with reddish brown mottling; wet; trace medium to coarse SAND; low plasticity; weak cementation.  50.0', grades to grayish brown.	ri I	Å	S14	46.5	50	50/	5	4	60.5	20.2	22	5	2.3		000000000000000000000000000000000000000		
			51.5', grades to grayish brown with reddish mottlin	ng.			51.5		5"	18	13							$\sim$		
7.025 2.2012			SILT (ML); hard; grayish brown with reddish brown wet; trace fine SAND; weak cementation.		$\frac{1}{2}$	S17 S18	53 53 54.5 54.5	18-29-40 31-45-50	69 95/	18	16	. 96.9	30.1							
223 60	55		SILT with SAND (ML); hard; grayish brown with re brown mottling; wet; little fine to medium SAND; medium plasticity; weak cementation.	eulisn			56		9"			82.9	35.7	39	10			000000000000000000000000000000000000000		
223.00			(continued)				1-	DEDOCT -	ı									1,	N.E.ID	_
	Н	Al	LIFORNIA Speed Rail Authority	RUP H-SPEED TR	IAN		F (	REPORT 1 BORING DIST. PROJECT Californ BRIDGE N	COU OR B	RIDG gh-	SE NA	AME ed T	UTE rain RED B ggi/T	Y	POSTN	/ILE	DA <sup>-</sup> 2-2	S EA	SHEET	

Cali LOGG A. P DRILL Pitc DRILL AUC SAMP SPT BORE	EED BY Poling ING CC her/W ING ME GER(0 LER TY T(1-3/8 HOLE E t ceme	NTRA Ster THOE -15.5 (PE(S)	Oct-24-11 Oct-2 CTOR/DRILLER wart ) 5'), ROTARY(15.5'-81.5') AND SIZE(S) (ID)	LETION DATE E25-11	N21: N-SITI DRILL Failii SPT H. Auto	RIC ND	592. EST 150 MER atic,	751 ING 0 177F 140	TION (Lat / E632	ER ID	n dro	pp	lation	nal G	rid)	Plasticity Index (%)	11 HG S SU 22 BG 33 H/4 GE) TG	315 DLE II BOOM JRFAM 283.6 DREH 3.875 3.875 DTAL 31.5 1 (jst) (jst)	Wethod We	EVATION NAVD88) HAMETER FICIENCY, ERI	
levatio	Depth (ft)	aterial				ample I	ample	ample	ows pe	-Value	enetrat	ecover	00 Was	oisture	quid Li	asticity	rganics	Shear St	Drilling M	Remarks/	
218.69	65	W	Poorly graded SAND with SILT (S grayish brown with reddish brown SILT; medium SAND; trace suba cementation.  Poorly graded SAND (SP); very of trace SILT; fine to medium SAND SANDY SILTY CLAY (CL-ML); his	SP-SM); very densin mottling; wet; few ngular GRAVEL; wellense; brown; wet; b; weak cementaticand; grayish brown;	veak	X	S19 S20	65 66.5	32-50 32-50 33-30-26	50/ 6"	12	8 16	67.3	24.6	- Fig. 1	7	2.1	ै ज	<u>-a                                       </u>	Other Tests	
213.69	70		wet; little fine SAND; trace mediu plasticity; weak cementation.  SANDY SILT (ML); hard; grayish SAND.		fine	M	S21	70	32-50	50/ 5"	11	11	55.5	\31.5/	33	8	2.3				
KARY.GLB 2/20/12 09:805	75							71.5					33.3	30.5	33	0	2.3				
F-B CHSK_F-B.GPJ ARUP DOTR LIB			Poorly graded SAND (SP); dense SILT; medium SAND; weak ceme				S22	75 76.5	29-22-16	38	18	13							000000000000000000000000000000000000000		
TS ISSUED			(continued)					1.											1.		
0.3 BOREHOLE LOG - CHSIP		- A		URS HMM AR	I IP			D	EPORT T BORING IST.	COL	INTY			UTE	P	POST	ИILE			0004R	
1.0.3 BUNET	Н	JA igh∹	LIFORNIA Speed Rail Authority	CALFORNA HOH-	SPEED TR	AN			ROJECT Californ RIDGE N	ia Hi	gh-S	Spe PF	AME ed T REPAF . Ma	RED B		ırran		DA 2-:	TE 20-1:	SHEET 2 4 of 5	

PROJE Cali			h-Speed T	rain Fre	sno to	Bakersfield														1315		IMBER O	
LOGG A. P	ED BY	9	BEGIN	DATE 24-11	COMP	LETION DATE 25-11					TION (Lat / E632								Н	OLE 10	)		
DRILLI	NG CC		CTOR/DRILL		- OCI-	<u>-</u> U-11	IN-SIT				, _032	7230	.411	(11	auuil	aı Ul	iu)		SL	JRFA	CE EL	EVATIO	
	ner/W						DDIII	DIO														NAVD	
DRILLI AUG			5'), ROTAR	RY(15.5'-8	81.5')		DRILL Faili		1500											3.875		DIAMETE	=K
			AND SIZE(S	) (ID)			1				E/HAMM			<u> </u>					- 1		REF	FICIENC	Y, ERi
	(1-3/8 HOLE F		FILL AND COM	MPLETION	ı						Ibs, 30			-	FTER	DRILI	ING (	DATE		S8% OTAL	DEPT	H OF BO	ORING
	ceme						READ				Not Re					t Rec			′ I	1.5 f			
		ς,														t (%)		(%		tsf)			
£		Material Graphics						Sample Location	Sample Number	Sample Deptn (π)	. <u>:</u>	/ft)	(ii)	<u></u>	(%	Moisture Content (%)	(%)	Plasticity Index (%)	(9)	Shear Strength (tsf)	ഉ	1	
Elevation (ft)	(#)	al Gr						e Loc	P S	e De	per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	ē C	Liquid Limit (%)	ity In	Organics (%)	Stre	Drilling Method	Š	
∃leva	Depth (ft)	/ateri		Г	Description	n		amp	sampl	amb	Blows	I-Valı	eneti	Secov	00 W	Aoistu	iquid	Pastic	)rgan	hear	rilling	Ren	narks/ r Tests
	-80	2	80.0', grade			ine to medium S/	AND.	_		-	11-21-18	39	18	14	- 7			ш	0	0)	_	Otric	1 10313
	∄		80.6', grade	s to fine SA	AND.			Ň	81	1.5											000000		
	85		5			504 5 40/04	10011														6		
	Ξ					of 81.5' on 10/24/	2011.																
	Ξ		For corrosio			because SPT sa	mnloo																
	Ξ		became wet	t during reti	rieval thro	ugh rotary methorition should not be	od <sup>*</sup>																
	Ξ		used as an i	indication o	of a potent	tial phreatic surfa	ice or																
198.69	85=		· ·			il classification cl	nart																
	∃		and key to to																				
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183.69	100				_						_				_							_	
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											IST.	COU		ບ	ROL	JTE	Р	OSTN	/ILE		E		•
	<b>(</b>	A	LIFOR	NIA		URS HMM	ARUP			PF	ROJECT	OR B	RIDG	E NA	ME_								
			Speed Rai		rity	CALFORNA HO	H-SPEED T	RAN			aliforn			PR	REPAR	ED B				DA	TE	SH	EEŢ
		_	•		•										Mag			rran		2-2	TE 20-1	2 5	of 5

Cali	fornia		h-Speed Train Fresno to Bakersfield													1	1315	77-00	MBER	
	ED BY		BEGIN DATE COMPLETION DATE Oct-13-11 Oct-14-11					TION (Lat / E632									OLE 10			
DRILL			ACTOR/DRILLER	IN-SIT	U TE	STI	NG							,		SI	JRFA	CE EL	EVATION	
DRILL	ING ME	THOI		DRILL	RIG			zometer	, 13	Log	iAiri	4						•	NAVD88) DIAMETER	
			ROTARY(5'-82') ) AND SIZE(S) (ID)	Faili				PE/HAMM	FR ID	)							1.875 AMME		FICIENCY, ERI	_
SPT	(1-3/8	3")		Auto	omat	tic,	140	lbs, 30	)-incl	n dro	•					(	68%			
BORE N/A	HOLE	BACKI	FILL AND COMPLETION	GROL READ			ER	DURING Not Re			<i>-</i>	AFTER N	DRIL ot Rec		(DATE	′	OTAL 32 ft	DEPT	H OF BORING	
Elevation (ft)	չ Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
	0		ASPHALT (7") (AC).		505 505	01	0			60	60								Hand auger to 5.0'	Ē
280.26	5		Poorly graded SAND with SILT (SP-SM); brown; of fine; subangular; trace SILT; trace coarse SAND; cementation; [FILL].	dry; weak		602	5 5	5-5-49	54	18	18	_							Modified Proctor: Max $\gamma_d$ = 133.9 pcf Optimum W <sub>i</sub> = 6%	,
					ЦΧ	١,	6.5					13.8							at 5.0' using 4.875" tricone bit; casing at 5.0'	
			Poorly graded SAND with SILT (SP-SM); very der reddish brown; dry; fine; few SILT; trace coarse S weak to moderate cementation; [ALLUVIUM].	nse; AND;	×s		6.5	50	50/	4	4							000	Gasing at 3.0	E
	<u></u>		weak to moderate comentation, [ALLOVIOIVI].				8		3.5"										7.0', driller notes hard material	
			8' grades to brown.		s		8 9.5	50	50/ 6"	6	6							000000000000000000000000000000000000000		
275.26	10-		SANDY SILT (ML); hard; reddish brown with gray brown mottling; moist; fine; trace organics; some SAND; low plasticity.		s	605	9.5	17-34-37	71	18	14	59.7	21.1	26	4	1.9	_			
			SANDY SILT (ML); reddish brown with grayish moist; fine; trace organics; some fine SAND; low plasticity.	 ottling;	s		11	9-23-22	45	18	14	57.6	21.8	23	3	1.5				
			SANDY SILTY CLAY (CL-ML); brown with reddish		s			21-42-50	92/	17	13									F
			mottling; wet.		Д		14		10.5"			67.7	18.4	23	5	2.1	-	<u> </u>		
			SANDY SILT (ML); brown.		s	808	14	28-50	50/ 5"	18	10	54.7								F
270.26	15					1	15.5		3			J4.7						<u> </u>	15.0', ends continuous sampling	
-265.26	_20		(continued)																	
			(continued)					EPORT 1											OLE ID	
								SORINO IST.		CO JNTY		RO	UTE	F	POSTN	ЛILE		S	0005R A	
<u>(=</u>	<b>(</b>	Δ	LIFORNIA LIRE HMM	ARUP			PI	ROJECT	OR B	RIDO	SE N	AME								
	H	igh-	Speed Rail Authority	H-SPEED TO	RAN		C	Californ RIDGE N	ia Hi	gh-	Spe			Y			DA	TE	SHEET	
		_										. Ma			ırran		2-	20-1	2 1 of 5	

	ECT NA		h-Speed Train Fresno to Bakersfield															T NUI 77-00		
LOGG	ED BY	ı ı ııg	BEGIN DATE COMPLETION DATE					TION (La								Н	OLE II	)		
	- 5	NTR/	Oct-13-11 Oct-14-11 ACTOR/DRILLER	IN-SIT				3 / E632	5230	.508	) (1\	lation	iai G	na)		_		DSR DE ELE	EVATION	_
	her/O					•	Pie	zomete	; PS	Log	ging	9						•	NAVD88)	
	ING ME SER(0		) ROTARY(5'-82')	DRILL Faili			00										OREH 1.875		IAMETER	
SAMP	LER T	PE(S	) AND SIZE(S) (ID)	SPT F	IAM	IMEF	R TYF	PE/HAMN								H	AMME		ICIENCY, ERI	
	(1-3/8		FILL AND COMPLETION	1				DURING				FTFR	DRII	LING	/DATE		38% 3TAI	DEPTH	OF BORING	
N/A	. TOLL	57 (0) (1	EL/MO GGM EL HON	READ				Not Re					ot Rec		(5, 1, 1		32 ft	<i>D</i>	101 2014110	
													(%)		(%)		(Js:			
£.		aphic			Location	nber	oth (ft	.⊑	€	(in)	<del>ر</del>	(%	nteni	(%)	gex (	<u>.</u>	Strength (tsf)	달		
tion (1	(#	al Gr			e Loc	e Nu	e De	per 6	lg) er	ation	ery (i	ash (	le C	Limit	ity	ics (%	Stre	) Metho		
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index	Organics (%)	Shear	Drilling Method Casing Depth	Remarks/ Other Tests	
	<b>-</b> 20 =		SILTY SAND (SM); dense; mottled dark reddish b	orown		S09		11-13-19	32	18	10				<u> </u>		0)	<del></del>	Other rests	+
	=		with grayish brown; wet; fine; little SILT; weak cementation.		А		21.5					17.5								į
	=																			
	_																			
	$\exists$																			
260.26	25		SILT (ML); very stiff; mottled dark grayish brown veddish brown; wet; few SAND.	 with	M	S10	25	10-11-13	24	18	10	04.0								
	=		reddish brown, wet, few SAND.		Н		26.5					91.9								
	<u> </u>																			
	$\exists$																			
	$\equiv$																			
	Ξ																			
	Ξ																			
255.26	30 =				$M_{-}$	S11	30	12-17-22	39	18	18									Ī
	=		SILTY CLAY with SAND (CL-ML); hard; grayish b with reddish brown mottling; wet; fine; trace organ		M		31.5					74.4	17	25	7	2.7	-	000000000000000000000000000000000000000		
	$\equiv$		some SAND; low plasticity.																	
	Ξ																			
	Ξ																			
	=																			
250.26	35																			
_55.20	-		Poorly graded SAND with SILT (SP-SM); very der grayish brown with dark yellowish brown mottling;		M	S12	35	26-42-50	92/ 11.5"	18	14	7.3						1000000000000000000000000000000000000		
	$\exists$		fine to medium; few SILT; weak cementation.		Н		36.5					7.3								
	∃																			
	Ę																			
	3																			
	=																			Ė
<b>-</b> 245.26	40-																			
			(continued)															1 :		
								REPORT S		CO	<u>R</u> D								DLE ID 0005R	
								DIST.	COL	INTY		RO	UTE	F	POSTI	MILE		EA		
	<b>(</b>	À	LIFORNIA QURS HMM A	ARUP			F	ROJECT	OR B	RIDG	E N	AME	rain							
	H	igh-	Speed Rail Authority	H-SPEED T	RAN			BRIDGE N			PF	REPAF	RED B	Y			DA	TE	SHEET	_
-245.20											D	. Ma	ggi/T	. Cu	ırran		2-	20-12	2   2 of 5	

	ECT NA fornia		h-Speed Train Fresno to Bakersfield															77-00		
LOGG	ED BY	9	BEGIN DATE COMPLETION DATE Oct-13-11 Oct-14-11					TION (Lat								Н	OLE I			
DRILL			CTOR/DRILLER	IN-SIT	U T	EST	ING	zometer					iai O	iiu)		SI	JRFA	CE ELE	EVATION	
DRILL	ING ME	THOE		DRILL	RIC	<u>.</u> Э		zometei	, PS	Log	giriç	J						•	NAVD88) IAMETER	
			ROTARY(5'-82') AND SIZE(S) (ID)	Faili				PE/HAMM	ED ID	1							1.875		ICIENCY, ERI	
SPT	(1-3/8	")		Auto	oma	atic	, 140	) lbs, 30	)-incl	n dro	•					6	38%		ICILINOT, LIN	
BORE N/A	HOLE E	BACKE	FILL AND COMPLETION	GROL READ			TER	DURING Not Re			6 A		DRIL ot Rec		(DATE		OTAL 32 ft	DEPTH	I OF BORING	
													(%)							$\top$
£		Material Graphics			ation	nber	Sample Depth (ft)	.⊑ਂ	Œ(	(ii)	<u></u>	(%	Moisture Content (%)	(%)	(%) xəp	<u> </u>	Strength (tsf)	و 4		
Elevation (ft)	(#	al Gra			e Loc	e Nur	le Dep	per 6	/lq) ər	ation	ery (ii	ash (	Ire Cc	Limit	ity	ics (%	Strer	Metho Depth		
Eleva	Depth (ft)	Materi	Description		Sample Location	Sample Number	Samp	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moistu	Liquid Limit (%)	Plasticity Index	Organics (%)	Shear	Drilling Method Casing Depth	Remarks/ Other Tests	
	40 =		SANDY SILT (ML); hard; brown with reddish brow mottling with seams of gravish brown; wet; little	vn	Ŵ	S13		30-36-50	86/ 11"	17	17	.,				J	0,	_		ŧ
	=		organics; some coarse SAND; low plasticity; weal cementation.	<	$\mathbb{N}$		41.5					59.5	24.3	33	6	5.1	1			E
																				E
	Ξ																			
	Ξ																			
	Ξ																			
240.26	45	Ш	SILT with SAND (ML); hard; grayish brown with re	 eddish	$\frac{1}{M}$	S14	45	21-50	50/	11	11									
	$\equiv$		brown mottling; wet; trace organics; low plasticity.		А		46.5		4.5"			79.7	33.1	36	9	3.5	-			
	₫	Ш	SANDY SILT (ML); hard; grayish brown with redd	 ish	$\mathbb{H}$	S15	46.5	30-50	50/	12	12									
			brown mottling; wet.		И		48		5.5"			56.6 62.3				0	1			E
	=				M	S16	48	18-26-25	51	18	16									E
	∃				M		49.5													
235.26	50—		SANDY SILTY CLAY (CL-ML); hard; brown with			S17	49.5	27-37-37	74	18	15									
	=		reddish bronw mottling; wet; some SAND; low pla	sticity.	М		51					64.5	19.8	24	4	1.8		000000000000000000000000000000000000000		
	Ξ																			
	=																			E
	=																			
	$\equiv$																			
	$\exists$																			
230.26	55		Poorly graded SAND with SILT (SP-SM); very der brown; wet; fine; few SILT; weak cementation.	 nse;	M	S18	55	20-27-31	58	18	16									
	=		blowif, wet, fille, few Sill, weak cementation.		$\mathbb{N}$		56.5					9								
	$\exists$																			E
	Ξ																			
																				Ē
230.26	∃																	1000000000000000000000000000000000000		E
-225.26	60		, ,, ,,																	
			(continued)					REPORT	TTI F									HC	DLE ID	
							E	BORING	3 RE	CO		PO	UTE	[	POSTI	MII E			0005R	
<b>223.23</b>	> (	٠,٨	LIFORNIA JURS HMM	ARUP									O1L		0011	VIILE			•	
			Speed Rail Authority	H-SPEED TO	RAN			ROJECT	ia Hi	gh-	Spe	ed T		· ·			5.		OLIFET.	
_	- 11	911-	Speed Rull Adillottiy				E	RIDGE N	UMBE	:K	PF D	REPAF	kEDB ggi/T	· Cu	ırran		DA:	TE 20-12	SHEET 3 of 5	

	ECT NA		h-Speed Train Fresno to Bakersfield													- 1		77-00			
LOGG	ED BY	a 1 11g	BEGIN DATE COMPLETION DATE Oct-13-11 Oct-14-11					TION (La								Н	OLE II	)			
					N2155457.493 / E6325238.589 (National Grid) N-SITU TESTING											SI	S0005R SURFACE ELEVATION				
	her/O: .ING ME		1	Star		•	Piez	zometer	; PS	Log	ging	3						•	NAVD88) IAMETER		
AUC	GER(C	'-5'),	ROTARY(5'-82')	Faili	ng	150										4	1.875	in			
	LER TY (1-3/8		) AND SIZE(S) (ID)	1				PE/HAMM D lbs, 30			ac					- 1	AMME 38%	REFF	ICIENCY, ERI		
BORE			FILL AND COMPLETION	GROL	JND	WA		DURING	DRIL	LING					(DATE	E) TO	OTAL	DEPTH	OF BORING		
N/A				READ	ING	5		Not Re	cordec			N	ot Rec	orded		<u>  8</u>	32 ft			$\overline{}$	
		soil			uo	Ē	( <b>f</b> )						Moisture Content (%)		(%)		Shear Strength (tsf)				
n (ft)	t)	Graph			ocati	dmn	Jepth	ır 6 in	(bl/ft)	ion (ir	/ (in)	(%) Y	Cont	mit (%	Inde	(%)	rengt	Metho			
Elevation (ft)	Depth (ft)	Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	isture	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	ar St	Drilling Method Casing Depth	Remarks/		
Ele		Σ	Description		Sar	S19		<u>용</u> 16-18-21	- <del>-</del> 2	18 18	16	200	Θ	ΡΞ	Pla	o o	Sh	_	Other Tests	4	
	=				M			10-10-21	39	10	10									F	
					Н		61.5											000		E	
220.26	00		65.0', grades to reddish brown; fine to medium S	AND.	X	S20	65	50	50/ 5.5"	6	6										
	=						66.5		0.0											E	
	Ξ																			E	
																				E	
																				F	
	=																				
215.26			-======================================	. <del></del>																	
			SILTY SAND (SM); very dense; reddish brown w yellowish brown; wet; fine; some SILT; weak cementation.	ith	M	S21	70	24-27-31	58	18	15							000000000000000000000000000000000000000		E	
			cementation.		Н		71.5					16 38.2								E	
	=																			E	
	Ξ																			E	
																				E	
																				E	
210.26	75	ШШ	Poorly graded SAND (SP); very dense; yellowish		$\forall$	S22	75	17-25-30	55	18	14									E	
	=		brown; wet; medium.		$\mathbb{A}$		76.5													E	
	$\equiv$																				
																		1000000000000000000000000000000000000			
																				E	
-205.26	80																				
			(continued)																		
								EPORT T		CO	RD								DLE ID 0005R		
_								IST.		INTY		RO	UTE	F	POST	ЛILE		EA	1	_	
			LIFORNIA LIRS HMM	ARUP			P	ROJECT	OR B	RIDG ah-	SE NA	AME ed T	rain								
	High-Speed Rail Authority								California High-Speed Train  BRIDGE NUMBER PREPARED BY  D. Maggi T. Curren								DA	TE	SHEET 4 of 5		
								D. Maggi/T. Curran								2-20-12   4 of 5					

PROJE Calif			h-Speed Train Fresno to Bakersfield	d														T NUI <b>77-00</b>			
LOGGED BY BEGIN DATE COMPLETION DATE A. Poling Oct-13-11 Oct-14-11						BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2155457.493 / E6325238.589 (National Grid)										H	HOLE ID				
DRILLING CONTRACTOR/DRILLER						N2155457.4937 E6325238.589 (National Grid) IN-SITU TESTING											S0005R SURFACE ELEVATION				
Pitcher/Oscar						•	Pie	zometer	r; PS	Log	ging	)				_	285.26 ft (NAVD88)				
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-82')					RIC ing		00										BOREHOLE DIAMETER 4.875 in				
SAMPLER TYPE(S) AND SIZE(S) (ID)								PE/HAMM										REFF	ICIENCY, ERI		
SPT(1-3/8") BOREHOLE BACKFILL AND COMPLETION								DURING				FTER	DRILI	ING	DATE		68% TOTAL DEPTH OF BORING				
N/A	.022			READ				Not Re					t Rec			′ I	2 ft				
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	S	
	80 =		SILT with SAND (ML); hard; brown with reddish mottling; wet; some fine SAND; weak cementat		_	S23	80	50	50/ 5"	5	5	74.9						<del>/ -                                     </del>			
			motting, wet, some time daylo, weak cementar	ion.			81.5														
	$\exists$		Borehole terminated at a depth of 82.0' on 10/14/2011.																		
	Borehole terminated at a depth of 82.0' on 10/14/2011. Overdrilled hole to 95.0' for PS Logging.  For corrosion test results, see Appendix E.  Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential physical in surface or																				
	Ⅎ		Soil moisture indicated as "wet" because SPT s	amples																	
200.26	85		became wet during retrieval through rotary met drilling fluid. Soil moisture indication should not	t be																	
	$\exists$		used as an indication of a potential phreatic sur free groundwater table.	face or																	
	$\exists$		See Borehole Log Legend for soil classification	chart																	
	90		and key to test data and sampler type.																		
	∄																				
	=																				
	Ξ																				
195.26	90 =																				
	₫																				
	$\exists$																				
	∃																				
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190.26	95																				
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	$\exists$																				
	∄																				
	$\exists$																				
I85.26 <b>-</b> 1	100																				
								REPORT											OLE ID		
CALIFORNIA QUESTIMMIA								BORINO DIST.		CO JNTY		ROL	P	OSTN	ЛILE	S0005R					
								PROJECT													
			Speed Rail Authority	HGH-SPEED T	TRAN			Californ	ia Hi	igh-9	Spe	ed T		· ·			- D.		CULET		
	- 11	9'''	oposa kan Aumorny				16	BRIDGE N	IOMBE	-K		REPAR			rran		DA	TE 20-12	SHEET 5 of 5	_	

Cali	ECT NA <b>forni</b> ED BY	a Hig	h-Speed Train Fresno to Bakersfield BEGIN DATE COMPLETION DATE	BORFI	HOLF	LOCA	ATION (La	t/Long	or N	orth/	East a	nd Da	tum)		1		T NUN <b>77-00</b> )		
N. 6	Goode	now	Oct-13-11 Oct-13-11	N21	5468	8.47	4 / E632								5	3000	)6R	-> /A T/ -> ·	
	ING CO gg/D.		ACTOR/DRILLER Pers	IN-SIT	U TES	TING									- 1			EVATION NAVD88)	
	ING MI		O ROTARY(5'-81.5')	DRILL Mob	RIG il B-8	0									- 1	OREH 3.75 i		IAMETER	
SAMP	LER T	PE(S	) AND SIZE(S) (ID)	SPT H	AMME	RTY	PE/HAMN								H	AMME		ICIENCY, ERI	
	(1-3/8 HOLE		FILL AND COMPLETION	GROU	NDWA		0 lbs, 30			•	FTER	DRIL	LING	(DATE	- 1	38% OTAL	DEPTH	OF BORING	
Nea	t cem	ent g	rout	READI	NGS		Not Re	cordec	t l		N	ot Rec	orded		8	1.5 f	t		$\overline{}$
		hics			ion	(#)	۔		(u			Moisture Content (%)	(%)	(%) x		Shear Strength (tsf)	g		
Elevation (ft)	(£	Material Graphics			Sample Location Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	e Con	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	streng	Drilling Method Casing Depth		
levation	Depth (ft)	ateria			ample	ample	ows p	-Value	enetra	ecove	00 Wa	oistur	quid L	asticit	rganic	near S	rilling	Remarks/	
Ш		Σ	Description ASPHALT (8") (AC).		₩ ₩     S0		⊞	Ż	60	60		Σ			0	<u>N</u>	<u> </u>	Other Tests Hand auger to	+
	=		AGGREGATE BASE (8") (AB).		000												}	5.0'	-
	Ξ		Poorly graded SAND with SILT (SP-SM); loose; but moist; medium; subrounded; rapid dilatancy; [FILL	rown; _].	200												{}		E
					202						13.9								E
					0.000												}		F
	Ξ				202												{		E
282.64	5-				() () so:	5 2 5	2-3-4	7	18	18							KI		F
	Ξ				X	6.5											000000000000000000000000000000000000000		
	Ξ		SILTY SAND (SM); very dense; reddish brown; we		)   S0:		22-50-51	101	18	18									
	Ξ		medium; subrounded; little SILT; slow dilatancy; for calcite seams [ALLUVIUM].	ew	X	8													F
	Ξ				S0-		16-25-24	49	18	16									Ė
			Grades medium dense; no calcite seams; some S	SII T	M	9.5					43.8								Ė
277.64	10-		Grades modium across, no salote scame, some s		S0:	5 9.5	14-13-10	23	18	15									E
	Ξ				Д	11													F
	Ξ				V S00	6 11	7-7-7	14	18	16									Ē
	Ξ					12.5													E
	=		Grades dense.		So.	7 12.5	7-17-27	44	18	15									
	Ξ		13.25', dense; olive brown and reddish brown; fine calcite streaks.			14	40 40 45	04	40	44									E
070.04	45		SANDY SILT (ML); hard; brown to reddish brown; slow dilatancy; calcite seams.	wet;	S0			31	18	14	68.2	21.9							
272.64	15=				$\Box$	15.5													F
	Ξ																		F
	-																		
	₫																		Ė
																			E
	Ξ																<u> </u>		Ė
267.64	_20		(continued)																
			(sommon)				REPORT											DLE ID	
							BORINO DIST.		CO JNTY		RO	UTE	F	POSTN	/ILE		S	0006R	
(	<b>(</b>	Δ	LIFORNIA QUESTHAMIA	RUP		F	PROJECT	OR B	RIDG	SE N	AME								
	H	ligh-	Speed Rail Authority	H-SPEED TR	AN	L	Californ	ia Hi	igh-	Spe	ed T	rain RED B	Y			DA	TE	SHEET	
		5	1			'	.,DOL IV	LIVIDL	`			ggi/T		ırran		2-2	20-12	2 1 of 5	í

	ECT NA		h-Speed Train Fre	sno to Bakersfie	ld														T NUN <b>77-00</b>		
LOGG	ED BY		BEGIN DATE Oct-13-11	COMPLETION DAT	E BORE				TION (La								Н	OLE ID			
DRILL		NTRA	ACTOR/DRILLER		IN-SIT				F7 L002	.0407	.+00	<i>y</i> (1.	<b>t</b> atioi		110)		SI	JRFA	CE ELE	EVATION NAVD88)	
	ING ME		ROTARY(5'-81.5')		DRILL Mob			١												IAMETER	
			) AND SIZE(S) (ID)		SPT F	ΙΑΝ	1MEF	R TYF	PE/HAMM								H			ICIENCY, ERI	
	(1-3/8		FILL AND COMPLETION						DURING			•	ETED	DDII	LINC	/DATE		38%	DEDTL	OF BORING	
	t cem				READ			IER	Not Re			, ,		ot Rec		(DATE		31.5 f		TOF BORING	
(ft)		raphics			•	cation	ımber	epth (ft)	6 in.	I/ft)	n (in)	(in)	(%)	Moisture Content (%)	ıt (%)	ndex (%)	(%)	Strength (tsf)	Method Depth		
Elevation (ft)	Depth (ft)	Material Graphics				Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	oisture C	Liquid Limit (%)	Plasticity Index	Organics (%)	Shear Stre	Drilling Method Casing Depth	Remarks/	
Ш	_20 <u> </u>	Ĕ ∏∏	SILT with SAND (ML);	Description stiff; brown; wet; little fi	ne SAND;	S V	S09		3-4-6	10	18	13	8	ž	Ĕ	ä	ō	क्र	_	Other Tests	+
			slow dilatancy.		·	X	·	21.5					75.2						000000000000000000000000000000000000000		
262.64	25		QE! grades to bond, sonic	id dilatana u raddiah ay	idi-od		S10	25	18-24-51	75	10	15									
	=		25' grades to hard; rapi parting; little medium to	id dilatancy; reddish ox o coarse SAND.	idized	X	510	26.5	18-24-51	75	18	15	77.4	22.8							
																			IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		
257.64	30		SILTY SAND (SM); der medium; interbedded w			X	S11	30 31.5	13-15-16	31	18	17	20.7								
																			000000000000000000000000000000000000000		
252.64	35		Poorly graded SAND (S medium; subrounded; t			X	S12	35 36.5	6-13-15	28	18	15							000000		
	-		SANDY SILT (ML); ver dilatancy.	y stiff; brown; wet; fine;	; slow	X	S13	36.5	10-15-19	34	18	18	71.5	25.8					MINNE		
			SILTY SAND (SM); me fine to medium; some S		rown; wet;		S14	38	11-12-11	23	18	17		15.3					MANNA		
-247.64	40-		SILTY SAND (SM); der	nse; reddish brown; we	t; fine to	$\forall$	S15	39.5	9-13-19	32	18	15	32.7								
-441.04	70		(continue	ed)																	
									REPORT BORING		CO	RD								DLE ID 0006R	
									DIST.		JNTY		RO	UTE	F	POSTN	ИLE		EA		
			LIFORNIA	MARUP			P	ROJECT	OR B	RIDO	SE N	AME T	rain								
	H	igh-	IA HIGH-SPEED T	RAN			BRIDGE N			PF	REPAF	RED B	Y			DA	TE	SHEET			
	High-Speed Rail Authority											D	. Ma	ggi/T	. Cu	ırran		2-2	20-12	2   2 of 5	)

	ECT NA fornia		h-Speed Train Fre	sno to Bakersfield															T NUN <b>77-00</b>		
LOGG	ED BY	•	BEGIN DATE Oct-13-11	COMPLETION DATE Oct-13-11					TION (La								Н	OLE II			
DRILL		NTR/	ACTOR/DRILLER	00:13-11	IN-SIT				F / L032	J <del>43</del> 1	.400	(1)	ialioi	iai G	iiu)		SI	JRFA	CE ELE	EVATION NAVD88)	
	NG ME		) ROTARY(5'-81.5')		DRILL															IAMETER	
			AND SIZE(S) (ID)						PE/HAMIV	IER ID	)							3.75 i Amme		ICIENCY, ERI	
	(1-3/8		THE AND COMPLETION						) lbs, 30					DDII	INIO	(DATE	- 1	38%	DEDT	LOE DODING	
	cem		FILL AND COMPLETION rout		READ			EK	DURING Not Re					ot Rec		(DATE		31.5 f		OF BORING	
Elevation (ft)	(ft)	Material Graphics				Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth		
Elevat	Depth (ft)	lateria	_	)opprintion		ample	ample	ample	lows	-Valu	enetr	ecove	00 W	loistu	iquid	lastic	rgani	hear	Drilling N	Remarks/	
Ш	40 =	<u>≥</u>	medium; subangular to	Description subrounded; trace GRAV	/EL;	S V	S	S	В	z	۵	œ	39.5	11.2			0	S	_	Other Tests	$\pm$
242.64	45		dense; reddish brown; v	ith SILT (SP-SM); mediun wet; medium; subangular few GRAVEL; slow dilata	to		S16	45 46.5	8-12-14	26	18	13	10.6						000000000000000000000000000000000000000		
237.64	50			et; fine to medium; subroi	unded;	M	S17	50	11-13-13	26	18	14							100000000000000000000000000000000000000		
232.64	555							51.5					6.4	14.2							
<b>-</b> 227 644			55.0°, very dense; brow few fines; slow dilatanc;	n; wet; medium; subround	ded;		S18	55 56.5	12-21-32	53	18	18							000000000000000000000000000000000000000		
227.04			(continue	d)																	
									REPORT S		CO	RD								DLE ID 0006R	
									DIST.		JNTY		RO	UTE	F	POSTN	/ILE		EA		
	H	A igh-	LIFORNIA Speed Rail Author	rity CALIFORNIA H	ARUP GH-SPEED TO	RAN			PROJECT Californ BRIDGE N	ia Hi	gh-S	Spe	ed T	RED B	Y			DA	TE	SHEET	
l										D	. Ma	ggi/T	. Cu	rran		2-	20-12	2   3 of 5	,		

	ECT NA		h-Speed Train Fresno to Bakersfield													- 1		77-00	MBER 1
LOGG	ED BY		BEGIN DATE COMPLETION DATE					TION (La								Н	OLE IE	)	
DRILL		NTR/	Oct-13-11 Oct-13-11 CTOR/DRILLER	IN-SIT				/ E632	J <del>4</del> 9/	.400	יו) ע	iallOf	iai G	iiu)		SI	JRFA		EVATION
	gg/D. ING ME			DRILL	DIC													,	NAVD88) DIAMETER
			, ROTARY(5'-81.5')	Mob			)										3.75 i		DIAIVIETER
	LER T		AND SIZE(S) (ID)					PE/HAMM D lbs, 30			าท					- 1	AMME 38%	REF	FICIENCY, ERI
			FILL AND COMPLETION	GROU	JND	WAT		DURING				FTER	DRIL	LING	(DATE			DEPT	H OF BORING
Nea	t cem	ent g	out	READI	ING	S		Not Re	cordec			N	ot Rec	orded		8	1.5 f	t	
		SS			u	_	(ft)						Moisture Content (%)		(%)		(tsf)		
Œ		Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	. 6 in.	bl/ft)	Penetration (in)	(in)	(%) ı	Conte	Liquid Limit (%)	Plasticity Index	(%)	Shear Strength (tsf)	Drilling Method Casing Depth	
Elevation (ft)	Depth (ft)	erial G			ple L	ple N	ple D	Blows per 6 in.	N-Value (bl/ft)	etratic	Recovery (in)	200 Wash (%)	ture (	id Lin	ticity	Organics (%)	ar Str	ng Me	
Elev	Dep	Mate	Description								Rec	200	Mois	Liqui	Plas	Orga	She	Drilling N	Remarks/ Other Tests
	-00-		Poorly graded SAND (SP); very dense; brown; we medium; subrounded; rapid dilatancy.	et;	M	S19	60	45-75-63	138	18	13							M	
			SILTY SAND (SM); very dense; brown; fine; little slow dilatancy.	SILT;	Ή		61.5												
	Ξ		olen allatalley.																<u> </u>
	=																		
222.64	65																		
			65.0', reddish brown; fine to medium; subrounded fines.	l; little	M	S20	65	26-34-34	68	18	13								
					Н		66.5												<u> </u>
	=																		=
	=																		
217.64	70 =		70.0', medium; red horizontal partings.		$\downarrow$	S21	70	24-47-50	97	18	13							<u> </u>	Red bedding 1/4
	=		70.0 , medium, red nonzoniai partings.		X			24-47-30	"	10	10								thick (horizontal bedding
					П		71.5												experienced at 70.67' to 70.75'; three well defined
	=																		red hematite oxidation zones
	Ξ																		<u> </u>
																			<u> </u>
212.64	75—	11:11	SILT with SAND (ML); hard; brown; wet; subround	 ded to	$\forall$	S22	75	26-50	50/	9	9								
			subangular; some fine SAND; low plasticity; media dry strength; no dilatancy; low toughness.	um	А		70.5		3"										
							76.5												PP: 1.0 tsf
																			PP: 1.0 tsf
212.64 I	=																		
1																			
-207.64																		<u> </u>	
	-80		(continued)																<u> </u>
			(oonanada)					REPORT											OLE ID
								BORING DIST.		CO		RO	UTE	F	OSTN	ЛILF		S	0006R
<b>2010</b>	<b>A</b> (	^ ^	IFODNIA TURS HIMM A	ARUP															
		-/-\ -/-\	LIFORNIA Speed Rail Authority					ROJECT	ia Hi	gh-	Spe	ed T							
		ign-	Deed Kall Authority	- SPEED TH	AN		В	RIDGE N	UMBE	R	PF D	REPAF . Ma	RED B ggi/T	Y <u>. C</u> u	<u>rran</u>		DA:	TE 20-1:	SHEET 2 4 of 5

	ECT NA I <b>forni</b> a		h-Speed Tra	ain Fresno	to Bakersfield												- 1	315		MBER )	
LOGG	ED BY	_	BEGIN D	DATE CC	OMPLETION DATE	BORE			TION (La								H	OLE 10	)		
DRILL	ING CC	NTRA	ACTOR/DRILLE		/UE 10-11		TU TES		r / LUJZ	∪ <del>1</del> 31	.+00	, (IV	auUl	iai Gl	iu)		SL	JRFA	CE EL	EVATION	
	gg/D. ING ME					י ווטט	DIC										_			NAVD88)	
			) ROTARY(5'-	-81.5')		DRILL Mol	- RIG bil B-8	0										жен 3.75 і		DIAMETER	
			) AND SIZE(S) (	(ID)		1			PE/HAMM D lbs, 30			n					- 1	AMME 38%	R EFI	FICIENCY, EI	₹i
	(1-3/8 HOLE I		FILL AND COMF	PLETION		GRO	JNDWA		DURING			•	FTER	DRILI	LING (	(DATE			DEPT	H OF BORIN	G
Nea	t cem	ent g	rout			READ	INGS		Not Re	cordec	t		No	ot Rec	orded		8	1.5 f	t	1	
		S					ב ב	lg)						Moisture Content (%)		(%)		(tsf)			
(ft)		Material Graphics					Sample Location Sample Number	Sample Depth (ft)	6 in.	J/ft	Penetration (in)	(ji	(%)	onte	Liquid Limit (%)	Plasticity Index	(%)	Shear Strength (tsf)	thod		
Elevation (ft)	Depth (ft)	rial G					ole Lo	ole De	Blows per 6 in.	N-Value (bl/ft)	tratio	Recovery (in)	200 Wash (%)	fure	d Lim	icity I	Organics (%)	r Stre	Drilling Method Casing Depth		
Elev	Dept	Mate		Descr	iption		Sam	Sam	Blow	N-Va	Pene	Reco	200 /	Mois	Liqui	Plast	Orga	Shea	Orillir	Remarks Other Tes	
	-80 		Grades red to	brownish red.			S23	80	13-19-16	35	18	8									
	=		Poorly graded medium.	SAND (SP); o	dense; grayish brown	; wet;		81.5													Ē
	85		<b>`</b>	ninated at a de	pth of 81.5' on 10/13	/2011.			!												
	=		For corrosion	test results, se	ee Appendix E.																
	Ξ		Soil moisture	indicated as "v	vet" because SPT sa	mples															Ī
			drilling fluid. S	Soil moisture ir	through rotary methodication should not lotential phreatic surfa	be															Ė
202.64	85		free groundwa	ater table.	otentiai prireatic suna	ace or															
	=			Log Legend fo	or soil classification o	hart															
			and key to tee	n data and san	прісі турс.																Ī
	=																				
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197.64	90-																				
	$\equiv$																				Ė
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192.64	95																				Ė
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	₫																				E
	=																				Ė
<b>-</b> 187.64	100																				
								F	REPORT 3	TITLE 2 DE		חח								OLE ID 80006R	
192.64									IST.		INTY	תט	ROI	JTE	P	OSTN	/ILE		E		
6	<b>(</b>	A	LIFORN	AIV	URS HMM	ARUP		F	ROJECT	OR B	RIDG	E NA	AME								
			Speed Rail		CALIFORNIA H	GH-SPEED T	TRAN		Californ BRIDGE N	ia Hi	igh-S	Spe	ed T		Y			DΔ	TE	SHEET	
		5	1						DOL IV	JIVIDL	`		. Ma			rran		2-2	TE 20-1	2 5 of	5

PROJE Cali LOGG	forni	a Hig	h-Speed Train Fre	esno to Bakersfield COMPLETION DATE	P∩DE		EIC	JCV.	TION (La	t/Long	or N	lorth/	East a	nd Da	tum)		_ 1		77-00	MBER )
N. G	ioode	now	Oct-14-11	Oct-14-11		1520	86.	945	5 / E632								5	3000	)7R	EVATION
Greg	gg/D.	Seld	ers					ING									2	285.1	1 ft (	NAVD88)
DRILLI			ROTARY(5'-81.5')		DRILL Mol	- RIG oil B-												окен 3.75 і		DIAMETER
SAMPI SPT			) AND SIZE(S) (ID)						PE/HAMM D lbs, 30			эр						AMME 38%	REF	FICIENCY, ERI
	HOLE	BACKI	FILL AND COMPLETION	I	GROU			ER	DURING Not Re			3 A		DRILI		(DATE	′ I	OTAL 31.5 f		H OF BORING
Near	Cerri	ent g	iout .						Notine	Cordec			IN		orded	<u> </u>	C			
æ		Material Graphics				ation	mber	Sample Depth (ft)	in.	(#)	(in)	(i	(%	Moisture Content (%)	(%)	Plasticity Index (%)	(9)	Shear Strength (tsf)	pod #	
Elevation (ft)	Depth (ft)	rial Gr				Sample Location	Sample Number	ole De	s per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	ure C	Liquid Limit (%)	icity In	Organics (%)	r Stre	Drilling Method	
Eleva	Dept	Mate	[	Description		Sam	Samp	Samp	Blows	N-Va	Pene	Reco	200 \	Moist	Liquic	Plasti	Orga	Shea	Drillir	Remarks/ Other Tests
		000	ASPHALT (6") (AC).  AGGREGATE BASE (6)	6") (AB).		2000	501	0			60	60								Hand auger to 5.0' to confirm no utilities
	Ξ		SILTY SAND (SM); me	edium dense; brown; moist few fine GRAVEL; rapid	t;	0.00														dilities
	Ξ		dilatancy; no cementat			200													}	
	=					202							30.8							
	=					000														
280.11	5—		Poorly graded SAND w	with SILT (SP-SM); very de n; wet; fine; little SILT; few	nse;	0.00		5											<u>}</u>	
	Ē			atancy; moderate cementa		Ms	502	5	52-96-50	146/ 9"	15	15	32.6	10.3						
	Ξ		5.0' - 6.3', calcite seam	ns.		//		6.5	21-42-70	112	18	17	02.0	10.0						
	Ξ		7.0', grades dense; wit	hout calcite; weak cementa	ation.	X		8					37.2	11.1						
	Ξ					/ \ //s	604	8	23-31-18	49	18	17								
	=					$\mathbb{N}$		9.5												
275.11	10		9.5', grades medium de	ense.		S	305	9.5	6-7-10	17	18	13	30.9	13.6						
	=		11.0', grades dense; fr	requent calcite seams.		\sqrt{s}	806	11	8-21-19	40	18	13							$\bowtie$	
	=		12.2' - 14.0', calcite sea	ams.			507	12.5	7-10-21	31	18	14							<u>0000000000000000000000000000000000000</u>	
								14	7 10 21		10		30.4	19.9						
	=		14.0', grades very dens	se.		\s\s	808	14	17-37-34	71	18	15							) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (	
270.11	15					$\mathbb{A}$		15.5					40.7	14.1					2000	
	=																			
	Ξ																			
	Ξ																			
	Ξ																		2000	
265.11	_20		(continue	ed)															Ø	
				<u> </u>					REPORT T		:00	טסט								OLE ID 6007R
									IST.	COL			RO	UTE	F	OSTN	/ILE		E/	
	(	CA	LIFORNIA	URS HMM	ARLIP			P	ROJECT	OR B	RIDO	SE N	AME	rain						
	H	ligh-	Speed Rail Autho	CALFORNA HE	GH-SPEED T	RAN			RIDGE N			PF	REPAR	RED B		rros		DA	TE	SHEET 2 1 of 5
												ΙD	. ıvıa	ggi/T	. Cu	rran		2-	20-1	2 1 of 5

LOGGED BY BEGII	(5'-81.5') S) (ID)	N219 IN-SITE DRILL Mob SPT H. Auto	RIG II B AMI Oma	D86. ESTI B-80 MER atic,	945 ING TYF 140	TION (Latin Latin	ER ID	n dro	5 (N	lation	nal G	rid)	(DATE	11 HG S SL 22 BG 33 H/4 8	1315 000 URFA 285.1 DREH 3.75 i	77-00 77R DE EL 1 ft ( OLE D n ER EFF		
Elevation (ft)	Description (CM)		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
to medium	ND (SM); medium dense; grayish brown i; rounded to subrounded; few SILT; rap weak cementation. e SILT.	n; fine			21.5	5-7-8	15	18	13	7.4/30.4						<u>10101010101010101010101</u>		
25.0', grad	ND (SM); dense; olive brown; wet; fine;	 some		S10	25 26.5	18-13-17	30	18	14							$\overline{ogo} \overline{ogo} $		
SAND; slov	SAND (ML); hard; olive brown; wet; little w dilatancy.  ND (SM); dense; brown; wet; fine to med; some SILT; slow dilatancy; reddish beeams.	′ dium;			30 31.5	7-11-30	41	18	17	84.2	29.7							
cementation	vn to reddish brown; fine SAND; weak on.				35 36.5	12-12-15	27	18	14	30.5						000000000000000000000000000000000000000		
	(continued)																	_
CALIFOR High-Speed Ro	RNIA  ail Authority	RUP H- SPEED TR	AN		D P	REPORT BORING BORING BIST. ROJECT Californ RIDGE N	COL OR B	RIDG gh-	SE NA	AME	RED B	Y	POSTN	/ILE	DA	S EA	SHEET	

Cali LOGG	ED BY	a Hig	h-Speed Train Fresno to Bakersfield BEGIN DATE COMPLETION DATE					TION (La								1 H	1 <b>315</b> 7			
	Soode ING CO	_	Oct-14-11 Oct-14-11 ACTOR/DRILLER	N21 IN-SIT				5 / E632	7473	3.995	) (N	latior	nal G	rid)			SOO( JRFAG		EVATION	
	gg/D. .ING ME			DRILL	DIC											_			NAVD88) IAMETER	
AUC	GER(C	'-5'),	ROTARY(5'-81.5')	Mob	il B	8-80										3	3.75 i	n		
	PLER TY (1-3/8		) AND SIZE(S) (ID)					PE/HAMM D lbs, 30			р					- 1	AMME 38%	R EFF	ICIENCY, ERI	
BORE	HOLE	BACKI	FILL AND COMPLETION		JND'	WAT		DURING	3 DRIL	LING	-	FTER			(DATE	) TO	OTAL		H OF BORING	
Nea	t cem	ent g	rout	KEADI	ING	<u> </u>		Not Re	cordec	1		N	ot Rec	orded		8	1.5 f	t 		$\top$
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
					M	S13	40	8-16-24	40	18	17								PP: 3.25 tsf TV: 5.0 tsf	Ħ
			SILTY CLAY with SAND (CL); hard; reddish brow wet; some SILT; some SAND; medium plasticity; medium dry strength; low toughness.	'n;	Δ		41.5					74.8	17.8	41	26					
240.11			SANDY SILT (ML); very stiff; reddish brown and grayish brown; some fine SAND; weak cementation	— — — on.		S14	45 46.5	8-12-17	29	18	15	68.2	28.6					<u> </u>	PP: 1.5 tsf TV: 2.0 tsf	
235.11			SILTY SAND (SM); medium dense; brown; wet; fi medium; subangular; some SILT; weak cementat			S15	50 51.5	9-12-12	24	18	18	17.6								
230.11			SANDY SILT (ML); very stiff; light brown; wet; sor fine SAND; slow dilatancy; weak cementation.	 me		S16	55 56.5	5-7-11	18	18	18	59.5						<u> </u>		
<b>-</b> 225.11	<b>-</b> 60-		(continued)						_	_							_			
<u></u>	<b>&gt;</b> (	۸-		ARUP			D	REPORT BORING	G RE	JNTY			UTE	F	POSTN	/ILE			DLE ID 0007R	
	H	JA liah-		PH- SPEED TE	RAN			ROJECT Californ RIDGE N	ia Hi	igh-	Spe	AME ed T REPAF		<b>V</b>			DA	TE	SHEET	
(continued)  CALIFORNIA High-Speed Rail Authority								" VIDGE IV	OIVIDE	-11		. Ma			rran		2-2	20-12	2 3 of 5	

Cali LOGG N. C DRILL Gree DRILL AUC SAMP SPT BORE	ED BY Goode ING CO gg/D. ING ME GER(0 LER TY	A High NOW Selde THOE '-5'), 'PE(S)	ROTARY(5'-81.5') AND SIZE(S) (ID)	N21 IN-SIT DRILL Mob	UT RIC Sil B AM Oma	O86. EST 3-80 MER atic,	.945 ING ) R TYF	TION (La 5 / E632 PE/HAMM ) lbs, 30 DURING Not Re	7473 ER ID )-inch	n dro	5 (N	lation	DRILL	rid)	(DATE	11 HG S SU 22 BG 33 H/4 8 SU 15 TG	13157 DLE 10 3000 JRFAC 285.1 DREHG 3.75 i AMME 38%	)7R CE ELE 1 ft (N OLE D n R EFF		
Elevation (ft)	S Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
	<b></b>		SILTY SAND (SM); dense; brown; wet; fine; som SILT; stratified with interbedding of SILT; no dilat weak cementation.			S17	61.5	18-14-24	38	18	18	41	17.5					000000000000000000000000000000000000000		
220.11	65		SANDY SILT (ML); hard; reddish brown; wet; subangular; some SAND; trace fine GRAVEL; mothermatite staining.	ottled		S18	65 66.5	13-20-28	48	18	18	50.1	17.9					<u> </u>		
215.11	70					S19	70 71.5	6-14-25	39	18	18							( U		
- 0.104 - 1.0.5F3 AROT DOIN LIBRARY 1.0LD 2/20/12	75		75.0' brown; reddish brown subhorizontal seams oxidation staining; no dilatancy; weak cementation			S20	75 76.5	16-20-50	70	18	14	51.5	22.4					000000000000000000000000000000000000000		
205.11	-80		(continued)																	
203.11	Н	A igh-	LIFORNIA Speed Rail Authority	ARUP GH-SPEED TE	RAN		E D	REPORT BORING DIST. PROJECT Californ BRIDGE N	COL OR B ia Hi	RIDG gh-	SE NA	AME ed T	UTE rain RED B	Y	POSTM	/IILE	DA <sup>-</sup> 2-2			

	ECT NA <b>forni</b> a		h-Speed Train F	Fresno to	o Bakersfield													ROJEC   <b>315</b>		IMBER <b>0</b>	
LOGG	ED BY Goode	_	BEGIN DATE Oct-14-11	COM	IPLETION DATE t-14-11				ATION (L 15 / E63								Н	OLE I	)		
			ACTOR/DRILLER		t-1 <del>4-</del> 11	IN-SIT				<u> </u>		, (11	ιαιιΟΠ	aı Gl	iu)			JRFAG		EVATION	
	gg/D.																			NAVD8	
	ING ME SER(0		)   ROTARY(5'-81.5	<del>5</del> ')		DRILL												OREH 3.75 i		DIAMETER	≺
SAMP	LER TY	PE(S	) AND SIZE(S) (ID)	,		1			YPE/HAM								H/	AMME		FICIENCY	, ERi
	(1-3/8		FILL AND COMPLETI	ION					40 lbs, 3			-	FTER	DRILI	ING (	DATE		38% OTAI	DEPT	H OF BOI	RING
	t ceme					READ				ecorde				t Reco		<i></i>	′	1.5 f			
		"												(%)		(%		(Jst)			
æ		Material Graphics					Sample Location	Sample Number	. <u>.</u>	(£)	(ii)	<u>-</u>	(%	Moisture Content (%)	(%)	Plasticity Index (%)	(9	Shear Strength (tsf)	pod £		
Elevation (ft)	(#	al Gr					е Гос	Sample Number	per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	le C	Liquid Limit (%)	ity In	Organics (%)	Strer	Drilling Method	3	
Eleva	Depth (ft)	lateri		Descript	ion		ampl	ampl	Blows	I-Valu	enetr	ecov	00 W	loistu	iquid	lastic	rgan	hear	rilling	Rema Other	
ш	-80	<u>≥</u> 	SILT with SAND (M	1L); hard; lig	ght olive brown; we		_	S21 80			18	13	2	2		<u>п</u>	0	S	_	Other	16212
	Ξ		frequent dark reddis	sh brown se	eams; weak cemen	itation.	$\triangle$	81	5				77.3	29.3							
	∄							0.	.0										0		
	Ξ		Borehole terminated	·		2011.															
	85		For corrosion test re Soil moisture indica	,	••	mplee															
	Ξ		became wet during drilling fluid. Soil m	retrieval the	rough rotary metho	od <sup>*</sup>															
	Ξ		used as an indication free groundwater ta	on of a pote	ential phreatic surfa	ice or															
200.11	85		See Borehole Log L		soil classification cl	nart															
	Ξ		and key to test data																		
	<u> </u>																				
	Ξ																				
	∃																				
	∃																				
105.11																					
195.11	90-																				
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185.11	100																				
								-	DEDODT	דודי ר									1	OLE ID	
									BORIN	IĢ RE		RD	T = -		T =	00-			8	80007R	
			LIEODY II	<b>A</b>	D				DIST.		JNTY		ROL	JTE	P	OSTN	/ILE		E	Α	
			LIFORNIA	URS HMM	ARUP			PROJEC Califor	T OR B nia Hi	RIDG gh-S	Spe	AME ed T	rain								
	Н	igh-	Speed Rail Aut	hority	CALIFORNIA HO	H-SPEED T	RAN		BRIDGE			PF	REPAR . Mag	ED B		rran		DA 2-	TE 20-1	SHE 2 5	ET of 5
													v.u	<u> """ "</u>	. <u>Ju</u>						<u> </u>

Cali	ED BY		h-Speed Train Fresno to Bakersfield  BEGIN DATE COMPLETION DATE	BORFI	HOLE	LOCA	ATION (La	t/Long	or N	orth/l	East a	nd Da	tum)		1	1 <b>315</b> 7 OLE ID	77-00		
N. G	Goode		Oct-17-11 Oct-19-11	N21	5092	1.784	4 / E632								3	300	10R		
Gre	gg/D.	Selde		IN-SITI Stan			zomete	r; PS	Log	ging	]							EVATION NAVD88)	
	ING ME SER(0		O ROTARY(5'-165')	DRILL Mob		0										OREH 3.75 i		IAMETER	
SAMP	LER TY	PE(S)	) AND SIZE(S) (ID)	SPT H	AMME	RTY	PE/HAMM 0 lbs, 30			nn.					H	AMME		ICIENCY, ERI	
BORE		SACKE	FILL AND COMPLETION	GROU	NDWA		DURING			•	FTER	DRIL	LING (	(DATE		38% OTAL	DEPTI	H OF BORING	
Piez	omete	er		READI	NGS	_	Not Re	corde	t 		N	ot Rec	orded		_	65 ft			$\neg$
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
	0 =		ASPHALT (8") (AC).		S0	1 0			60	60							{{	Hand auger to 5.0'	
			AGGREGATE BASE (4") (AB).  SILTY SAND (SM); brown; moist; fine to medium; dilatancy; [FILL].	; rapid	2002020000						22.3								
281.12	5		SILTY SAND (SM); medium dense; brown; moist; to medium; [ALLUVIUM].	fine	\$0000 S00	6.5	5-7-11	18	18	18	24.4	4.8							
			SANDY SILT (ML); hard; grayish brown; wet; fine plasticity; slow dilatancy; weak cementation. Grades wet.	; low	S0:	8	10-21-27	48	18	17	57	15.9					000000000000000000000000000000000000000		
276.12	10		SANDY SILTY CLAY (CL-ML); hard; brown; wet; plasticity; slow dilatancy.	 low	Sos	9.5 5 9.5 11	14-20-24	44	18	17	52.9		27	5	3.2	_			-
			SILTY SAND (SM); medium dense; brown; wet; fi some SILT.	ne;	So	12.5	5-7-10	17	18	17	41.7	16.4							
	1		SANDY SILTY CLAY (CL-ML); hard; grayish brow wet; fine SAND; low plasticity; fine; mottled grayis brown and brown.		So.	7 12.5	14-25-24	49	18	15	\58.9/ 15.2		29	7	1.5				
271.12	15		14.0', grades brownish gray.		Soa	15.5	10-13-16	29	18	15							<u> </u>		
<b>-</b> 266.12 <b>-</b>	20																DODDO		
	-		(continued)			1 -	DED05=										1	N E ID	
		- A 1				[	REPORT BORING DIST.	G RE	JNTY	,		UTE	P	POSTN	ИILE			0010R	
	H	_A igh-	LIFORNIA Speed Rail Authority	H-SPEED TR	AN		PROJECT Californ BRIDGE N	ia H	igh-	Spe PF	ed T REPAR . Ma	RED B		ırran		DA <sup>1</sup>	TE 20-12	SHEET 2 1 of 9	

Cal	ECT NA	a Hig	h-Speed Train Fresno to Bakersfield															T NUI 77-00		
LOGG	SED BY Goode	_	BEGIN DATE COMPLETION DATE Oct-17-11 Oct-19-11	BORE N21	HO 50	LE L 921	OCA .784	TION (La I / E632	t/Long 8341	or No.	orth/l	East a latior	nd Da nal G	tum) rid)			300°	10R		
DRILL	ING CO	NTR/	ACTOR/DRILLER	IN-SIT	TU T	EST	ING							,		SI	JRFA	CE ELE	EVATION	_
	gg/D. .ING MI			DRILL			Ple	zometei	"; PS	Log	gınç	9						,	NAVD88) IAMETER	
AUG	GER(C	'-5'),	ROTARY(5'-165')	Mot	oil E	3-80			IED ID							_	3.75 i		ICIENOV ED:	
	/LER 11 [(1-3/8		) AND SIZE(S) (ID)					PE/HAMM D lbs, 30			р						4MME 38%	K EFF	ICIENCY, ERI	
	HOLE		FILL AND COMPLETION	GROU READ			TER	DURING Not Re			i A		DRIL ot Rec		(DATE		OTAL 165 ft		OF BORING	
1 102	Omet	,						Notite	Coracc					oraca						Т
Elevation (ft)	(ft)	Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth		
levati	Depth (ft)	lateria	Description		ample	ample	ample	lows	-Valu	enetra	есоле	30 Wa	loistur	quid I	lastici	rganic	hear (	rilling asing	Remarks/	
-Ш		≥	Description  SILTY SAND (SM); medium dense; grayish brown	n and	Ω̈́	S09	20	9-11-13	24	18	<b>1</b> 6	7	Σ		<u> </u>	0	S	<del>/ -    </del>	Other Tests	$\pm$
	=		brown; wet; medium; subrounded; trace GRAVEL dilatancy; stratified; interbedded reddish brown	.; slow	X		21.5					36.5/	16.9							E
			oxidation stained pockets.									57.1								
																				E
	=																			E
261.12	25—					040	05	44.45.40	20	40	40									
			SILT (ML); very stiff; grayish brown; wet; trace SA medium plasticity; medium dry strength; low tought	AND; hness.	$\mathbb{V}$	S10	25	11-15-18	33	18	18	212	00.0	0.5	10					E
					$\Lambda$		26.5					94.6	30.8	35	10			<u>0000000000000000000000000000000000000</u>		
																				Ħ
	=																			
																				E
256.12	30 =		SILTY SAND (SM); medium dense; brownish gra	 y; wet;	1/	S11	30	7-9-10	19	18	16									E
	=		fine to medium; subrounded; rapid dilatancy; primquartz, muscovite, and trace mafic minerals.	narily	X		31.5					23.7	20.9							
																				E
																				E
251.12	35—																			
231.12	3				$\mathbb{V}$	S12	35	9-10-11	21	18	17									
					$\Lambda$		36.5					22.7/ 15.2	17.4							E
	=																			
																				E
251.12																				Ė
																		000000000000000000000000000000000000000		F
<b>-</b> 246.12	40-		(continued)																	E
			(continued)				F	REPORT T	ΓITLE									НС	DLE ID	
							E	BORING	3 RE	CO		R∩	UTE		POSTN	/II F			0010R	
<b>2</b> 40.12	> (	^ ^		ARUP									UIL		JJ 1 N	viiLL				
			LII OKINA	H-SPEED T			(	ROJECT	ia Hi	gh-	Spe	ed T					T -		1	
	High-Speed Rail Authority				MAN		В	RIDGE N	UMBE	:R		REPAF			ırran		DA 2-2	TE 20-12	SHEET 2 of 9	

DRILLING CO Gregg/D.  DRILLING MAUGER(COMPLER TO SPT(1-3/4)	enow ONTRA Selde ETHOD D'-5'), YPE(S) BACKF		N21 IN-SIT Star DRILL Mob	UT ndp RIC iil E IAM	921 EST ipe 3 8-80 MER atic,	.784 Piez ) R TYF	TION (Late of Late of	8341 ;; PS ER ID )-inch	Log	ging	lation	DRILL ot Rec	rid)	(DATE	11 H(C) SI 22 B(C) 3 H/V 8 E(C) T(C)	13157 OLE II 3001 URFA 286.1 OREH 3.75 I AMME 38%	77-00 10R 10E EL 2 ft ( OLE D n R EFF	EVATION NAVD88) DIAMETER FICIENCY, ERI H OF BORING
Elevation (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
241.12 45		Poorly graded SAND with SILT (SP-SM); dense; reddish brown; wet; medium; subrounded; trace g slow dilatancy.  SANDY CLAY (CL); hard; reddish brown; wet; fin trace organic; medium plasticity; slow dilatancy.		X	S13	41.5	13-19-17	45	18	17	50.3	15.2/	24	10	3.1		1000000000000000000000000000000000000	
236.12 50		CLAY with SAND (CL); hard; grayish brown; wet; trace organic; low plasticity; slow dilatancy.	fine;		S15		13-16-19	35	18	16	75.1	15.7	30	9	1.5		1 – I	
231.12 55		55.0°, brownish gray; medium plasticity; medium strength; medium toughness; frequent reddish broxidation.		X	S16	55 56.5	8-13-23	36	18	18	78.3	31.7	41	17			3000000000000000000000000000000000000	PP: 1.0 tsf TV: 2.5 tsf
<b>-</b> 226.12 <b>-</b> 60		(continued)															9	
-220.12-00	CA ligh-	LIFORNIA Speed Rail Authority	ARUP	RAN		E D	REPORT TO BORING ST.  PROJECT Californ RIDGE N	COL OR B ia Hi	INTY RIDG gh-S	Spe	AME ed T	UTE rain RED B	Y	POSTN		DA 2-2	S EA	SHEET

	ECT NA <b>forni</b> ED BY	a Hig	h-Speed Train Fresno to Bakersfield  BEGIN DATE COMPLETION DATE	BORE	НО	LE L	OCA	TION (La	t/Long	or N	orth/	East a	nd Da	tum)		1		77-00	MBER )	
N. G	ioode	now	Oct-17-11 Oct-19-11	N21	50	921	.784	I / E632										10R		
		Selde	CTOR/DRILLER ers	IN-SIT Star				zometei	; PS	Log	ging	9				- 1			EVATION NAVD88)	
AUG	ER(C		ROTARY(5'-165')	DRILL Mob	il E	3-80										3	3.75 i	n	NAMETER	
	LER T (1-3/8		AND SIZE(S) (ID)	I				PE/HAMM D lbs, 30			go					- 1	amme 38%	REF	FICIENCY, ERI	
BORE	HOLE	BACKF	FILL AND COMPLETION	GROL	JND	WA		DURING			•	FTER	DRIL	LING	(DATE	- 1		DEPT	H OF BORING	
Piez	omet	er		READ	ING	S		Not Re	cordeo	i		N	ot Rec	orded	I	_   1	165 ft	: 		$\overline{}$
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
	<b>-</b> 60		SANDY CLAY (CL); very stiff; olive brown; wet; fir low plasticity; rapid dilatancy.	ne;	M	S17	60	6-11-14	25	18	16							<b>S</b>		
221.12	65		low plasticity, rapid dilatancy.		Λ		61.5					64.5	23	25	8	1.9		varabararararararararararararararararara		
221.12	05		65 reddish brown; medium; subrounded; stratified laminated; medium plasticity; medium dry strengtl		M	S18	65	9-10-13	23	18	17									F
	Ξ		slow dilatancy; low toughness.	,	$\mathbb{A}$		66.5					63.5	21.7	43	26	5.8				
216.12	70																			
			70.0', grades hard.			S19	70	13-17-18	35	18	15							U I		
211.12	75 <del></del>		SILTY SAND (SM); dense; light brown; wet; fine t medium; interbedded with SILT; hard, brownish g	o ray,	M	S20	75	18-24-24	48	18	15									
-206 42			wet; low plasticity; low dry strength; low toughness		$\Lambda$		76.5											200000000000000000000000000000000000000		
<b>-</b> 206.12 <mark>-</mark>	-0U		(continued)																	
							E	REPORT BORING DIST.	3 RE	CO		RO	UTE	F	POSTI	MILE			OLE ID 0010R	
<u></u>	<b>(</b>	٦Δ١	LIFORNIA LIRE HMM	RUP			P	ROJECT	OR B	RIDO	SE N	AME								
	H	ligh-	Speed Rail Authority	H-SPEED TO	RAN			Californ BRIDGE N	ia Hi	gh-	Spe PF	ed T REPAR . Ma	RED B		ırran		DA	TE 20-1:	SHEET 2 4 of 9	
											$\perp \nu$	. ivid	yyı/ l	. U	mall		4-	را −∪_	_   + 0  9	

	JECT NA		h-Speed Train Fres	ano to Bakersfield	l														T NUN	
LOG	GED BY Goode		BEGIN DATE Oct-17-11	COMPLETION DATE Oct-19-11	BORI				TION (Lat								Н	OLE IE		
DRIL	LING CC	NTRA	ACTOR/DRILLER	300 10 11	IN-SI	TU T	EST	ING						0	,		SI	JRFA	CE ELE	VATION
	egg/D. LING ME				Sta		•	Pie	zometer	; PS	Log	ging	1						•	IAVD88) AMETER
AU	GER(0	'-5'),	ROTARY(5'-165')		Мо	bil E	3-80										3	3.75 i	n	
	PLER TY T(1-3/8		) AND SIZE(S) (ID)						PE/HAMM D lbs, 30			р						4MME 38%	R EFFI	CIENCY, ERI
BOR		BACKI	FILL AND COMPLETION		GRO READ			ΓER	DURING Not Re			i A		DRIL ot Rec		(DATE	′	OTAL 165 ft		OF BORING
	20111010	,1							Not no	Sorace			- 11		oraca					
Elevation (ft)	Depth (ft)	Material Graphics	Di	escription		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
	80 =		SANDY SILT (ML); hard fine; subrounded; low plant	; light gray brownish gra asticity; rapid dilatancy;	ay; wet; mottled	V	S21	80	19-23-30	53	18	18								
201.12	2 85		reddish oxidation stainin	.g.				81.5				1-	58	28.4	25	2	1.8		0.0000000000000000000000000000000000000	
			SILT with SAND (ML); v fine; low plasticity.	ery dense; brownish gra	ay; wet;	M	S22	85	8-24-34	58	18	17	74.5	24.2	27	4	1.6			
						Δ		86.5					74.5	31.3	21	1	1.6			•
196.12	2 90																			
			SANDY SILT (ML); dens	e; brownish gray; wet; f	îne.		S23	90	10-16-27	43	18	15	66.5						0000	·
191.12	95	<del>]                                      </del>	SILTY SAND (SM); dens	eo: brownish grav: wot: f			S24	95	13-18-21	39	18	16								
P.F.B. CHSR_F-B.GPJ. ARUP DOTR LIBRARY.GLB 2/20/12 81- 15- 15- 15- 15- 15- 15- 15- 15- 15- 1	100		SiLTY SAND (SM); den: little SILT; trace GRAVE 95.8' - 95.9', gravel sear	L.	ui iC,		024	96.5	10-21	- 58	10	10							000000000000000000000000000000000000000	
TST			(continued	1)															,	
0.3 BOREHOLE LOG - CHSTP	<b>a</b> (	Δ	LIFORNIA	URS HMM	ARUP			E C	REPORT TO BORING PROJECT	COU OR B	INTY	E NA	AME	UTE	F	POSTN	/ILE			LE ID 0010R
BOR!	H	igh-	Speed Rail Author	CALFORNA P	HIGH-SPEED	TRAN		(	Californ RIDGE N	ia Hi	gh-S	Spe	ed T	rain RED B	Y			DA	TF	SHEET
1.0.5		3		,					" VIDOL IV	OWIDE	-1 \			ggi/T		rran		2-2	20-12	5 of 9

	JECT N <b>liforni</b>		h-Speed Train Fresno to Bakersfield															T NUI		
LOG	GED BY Goode	′	BEGIN DATE COMPLETION DATE Oct-17-11 Oct-19-11	BORE N21	HO	LE L 921	OCA 784	TION (La I / E632	t/Long	or N	orth/	East a	ind Da	tum)		Н	OLE II			
DRIL	LING C	ONTRA	ACTOR/DRILLER	IN-SIT	U T	EST	ING							,		SI	URFA	CE ELE	EVATION	
	egg/D. LING M			Star		•	Pie	zometei	; PS	Log	ging	9				_		•	NAVD88) IAMETER	
AU	GER(	0'-5'),	ROTARY(5'-165')	Mob	oil E	3-80										3	3.75 i	n		
	PLER 1 T(1-3/3		) AND SIZE(S) (ID)					PE/HAMM D lbs, 30			р						AMME 88%	K EFF	ICIENCY, ERI	
	EHOLE		FILL AND COMPLETION	GROL READ			ΓER	DURING Not Re			G A		R DRIL		(DATE		OTAL 165 ft		OF BORING	
1	2011100							1101110	00.000					0.404						Т
		phics			ation	per	th (ft)	<u>.⊑</u>	æ	(ii)		(%)	Moisture Content (%)	(%)	(%) xə		Shear Strength (tsf)	ا م		
ion (ft	(#)	al Gra			e Loca	e Nun	e Dep	per 6	le (bl/l	ation	ery (in	ash (9	e S	Limit	ity Inc	%) sɔ	Stren	Meth Dept		
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Aoistu	Liquid Limit (%)	Plasticity Index	Organics (%)	Shear	Drilling Method Casing Depth	Remarks/ Other Tests	
	100 =	-	Poorly graded SAND with SILT (SP-SM); medium dense; gray; wet; medium; subrounded; trace SIL	) T	V	S25		15-19-16	35	18	15	(4					0)		01101 10010	ŧ
	=		dense, gray, wet, medium, subrounded, hace oil	.1.	$\Lambda$		101.5					13.9	18.9							F
																				E
	=																			E
	=																			Ē
	=																			Ē
181.1	2 105	1	SILT with SAND (ML); hard; grayish brown; wet; I		1	S26	105	25-33-59	92	18	17							<u>0000000000000000000000000000000000000</u>		
			plasticity; low dry strength; slow dilatancy; low toughness.	•••	X		106.5					77.1								
			-		7.		106.5													Ė
																				Ē
	=																			Ė
	=																			
176 1	2 110																			Ė
170.1.			SILTY SAND (SM); dense; brown to dark brown; fine; subangular; little SILT; trace coarse SAND; s	wet; slow	$\mathbb{V}$	S27	110	15-21-22	43	18	18									
			dilatancy.		$\triangle$		111.5					31.9								Ē
	=																			Ė
2120112	=																			
2/2 1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-																				E
15 15	=																			E
171.1	2 115		115.0', grades medium dense; brown.		$\bigvee$	S28	115	11-15-20	35	18	18									F
2	=				X		116.5													E
L C																				
17924 - 1-8.05-3 AROT DO IN LIBRARY. GLB																				Ē
	=																	000000000000000000000000000000000000000		Ė
ը -166.1:	2-120-		(																	
2			(continued)					REPORT	TITI F									НС	DLE ID	
							E	BORING	3 RE	CO		<b>₽</b> ∩	UTE		POST	ΛII ⊑			0010R	
0.3 BOREHOLE LOG - CHSIP	<b>&gt;</b> /	^ ^	IIEODNIIA Turs HMM /	ARUP									01E		0011	vIILĒ			•	
S S			LII OKINIA	H-SPEED TO	RAN		(	ROJECT	ia Hi	igh-	Spe	ed T		N/			15:		OUEST	
50.7		ngn-	Speed Rull Admortly	- or title Ti	- Colore		B	RIDGE N	UMBE	±R			RED B		ırran		DA 2-	TE 20-12	SHEET 6 of 9	

Ca	JECT N	ia Hi	gh-Speed Train Fresno to Bakersfield															77-00	
LOG	GED B Good	Υ	BEGIN DATE COMPLETION DATE Oct-17-11 Oct-19-11	BORE N21	HO 50	LE L 921	OCA .784	TION (La 1 / E632	Long 8341	or N .737	orth/	East a	nd Da	tum) rid)			OLE 10	10R	
DRIL	LING (	CONTR	ACTOR/DRILLER	IN-SIT	UT	EST	ING							,		SI	URFA	CE ELE	EVATION
		. Seld иетно		DRILL		•	Ple	zometei	; PS	Log	ging	3				_		•	NAVD88) HAMETER
AU	JGER(	(0'-5'),	ROTARY(5'-165')	Mob	oil E	3-80		DE // LAB 48	ED 15							_	3.75 i		COLEMON ED.
	PLER T(1-3		S) AND SIZE(S) (ID)					PE/HAMM D lbs, 30			р						AMME 88%	K EFF	TICIENCY, ERI
BOR		BACK	FILL AND COMPLETION	GROL READ			TER	DURING Not Re			e A		R DRIL				OTAL 165 ft		H OF BORING
- 10	201110	ici			T			NOTINE	cordec					Jorded					
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
٣	120-	_ ≥	SAND with SILT (SP-SM); very dense; grayish bro	own;	\/	S29		15-22-35	57	18	16	7	2		<u> </u>	0	S		Other rests
161 1	2 125		wet; fine; few fines; variegated with dark brown coloring; reddish brown oxidation staining.				121.5											<u>0000000000000000000000000000000000000</u>	
161.1	2 125		SILT with SAND (ML); hard; brownish gray; wet; lo plasticity; medium dry strength; low toughness;	ow	$\bigvee$	S30	125	38-68-50	118/ 8"	14	14		00.0		10				
	-		varigated with brown partings.		$\Lambda$		126.5					70	36.9	44	12				<u> </u>
	-																		=
156.1	2 130-		SILTY SAND (SM); very dense; brownish gray; w			931	130	20-28-27	55	18	18								
		3111	fine.	eı,	Ŋ				55	10	10	40.0	-						
151.1	2 135		Poorly graded SAND (SD) year deeper light	<u> </u>	<u> </u>		131.5		Ω4	19	19	46.3						<u> </u>	
		<b>]</b>	Poorly graded SAND (SP); very dense; light grayis brown; wet; fine; trace fines; rapid dilatancy.	sh	$\bigvee$	S32	135	25-34-47	81	18	18								
	-				$\Lambda$		136.5												
	-																		
	-																		
1																			
<b>-</b> 146.1	2 <b>-</b> 140 <b>-</b>		(continued)					ı											
6								REPORT S		:CO	BL								DLE ID 0010R
								IST.		INTY		RC	UTE	F	POST	ИILE		EA	
6		CA	LIFORNIA QURS HMM A	ARUP				ROJECT					roi-						
V			Speed Rail Authority	H-SPEED TO	RAN			Californ BRIDGE N			PF	REPA	RED B				DA	TE	SHEET
<u> </u>											D	. Ma	ıggi/⊺	<u>Γ. Cι</u>	ırran		2-	20-12	2 7 of 9

DRILLING CO Gregg/D.  DRILLING ME AUGER(0  SAMPLER TY SPT(1-3/8)	now NTRA Selde THOD '-5'), (PE(S) ") BACKF		IFE BORE N21 IN-SIT Star DRILL Mob	TU T ndp RIC DII E HAM DMG	921 EST ipe 3-80 IMER atic,	.784 Pie: ) R TYF , 140	TION (Lat 1 / E632 zometer PE/HAMM O Ibs, 30 DURING Not Re	8341 ; PS ER ID I-inch	Log	ging	latior	DRIL ot Rec	rid)	`	11 H(C) SI 22 B(C) 3 H/V 8 E(C) T(C)	1315 1315 1300	77-00 O 10R CE ELI 2 ft (I OLE D n ER EFF	EVATION NAVD88) HAMETER FICIENCY, ERI H OF BORING
Elevation (ft)	Material Graphics	Description  CLAYEY SAND (SC); very dense; brownish of		Sample Location		Sample Depth (ft)	Blows ber 6 in.	% N-Value (bl/ft)	ন Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
136.12 150		Fine; little CLAY; no dilatancy; variegated darbrown parting oxidations.  Poorly graded SAND (SP); dense; light olive wet; medium; subrounded.  SILTY SAND (SM); very dense; light brown; some SILT; slow dilatancy.	k yellowish		\$34	141.5 145 146.5	15-15-17 17-32-36	32 68	18	17	30.8	36.8					(000000000000000000000000000000000000	Created a rat hole down to 165.0'
-126.12 <b>-</b> 160		(continued)					•											
22.12=100 H	CAI	LIFORNIA Speed Rail Authority	MM   ARUP	RAN		E F	REPORT TO BORING ST.  PROJECT Californ BRIDGE N	COL OR B	RIDG	Spe	AME ed T	RED B		POSTN		DA 2-:		

	ECT NA <b>forni</b> a		h-Speed Train Fres	sno to Bakersfie	ld												- 1		T NUI <b>77-00</b>	
LOGG	ED BY	•	BEGIN DATE Oct-17-11	COMPLETION DAT Oct-19-11	E BORE				TION (La I / E632								Н	OLE IE		
DRILL	ING CC	NTRA	CTOR/DRILLER	000 10 11	IN-SIT	UT	EST	ING						iai C	iiu)		SI	JRFA	CE ELE	EVATION
	gg/D. ING ME				Star		-	Pie	zometei	r; PS	Log	ging	)				_			NAVD88) IAMETER
			, ROTARY(5'-165')		Mob			)									- 1	3.75 i		IAIVIETER
			AND SIZE(S) (ID)		1				PE/HAMN			'n					- 1		REFF	ICIENCY, ERI
	(1-3/8 HOLE I		ILL AND COMPLETION						DURING			-	FTER	DRILI	LING (	(DATE	- 1	38% OTAL	DEPTH	OF BORING
Piez	omete	er			READ	ING	S		Not Re	corde	d			ot Rec		`	′ I	65 ft		
Elevation (ft)	Oppth (ft)	Material Graphics	D	escription		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
	165																		000000000000000000000000000000000000000	
116.12			Borehole terminated at a 10/19/2011. Overdrilled For corrosion test result Soil moisture indicated a became wet during retri drilling fluid. Soil moistu used as an indication of free groundwater table. See Borehole Log Lege and key to test data and	I hole to 165.0' for PS s, see Appendix E. as "wet" because SPT eval through rotary me ure indication should n a potential phreatic so nd for soil classificatio	samples ethod ot be urface or															
-106.12																				
								1 -	NED05=	<b></b>									1	N.E.ID
								E	REPORT BORING	G RE		RD							S	DLE ID 0010R
_			UE 0 5 \ \ \ \ \						DIST.		JNTY			JTE	P	POSTN	/ILE		EA	
			LIFORNIA	URS HM	MARUP			F	ROJECT	OR B	RIDG	E NA	AME ed T	rain	'					
	H	igh-S	Speed Rail Author	CALFORN	IA HGH-SPEED TO	RAIN			BRIDGE N			PF	REPAR	RED B				DA	TE 20-12	SHEET
												J D	. Mag	ggi/T	. Cu	rran		2-2	20-12	9 of 9

N. Goo DRILLING Gregg/ DRILLING AUGER	rnia BY oden CON D. S MET R(0'-	Mig ow NTRA Selde THOI -5'),		N214 IN-SITU PS L DRILL Mobi	1821 J TES oggir RIG I B-8	5.466 TING ng 0	ATION (La 6 / E633	0773	3.973						SU S	13157 OLE II 3001 URFAC 287.5 OREH	12R CE ELE 7 ft (1 OLE D n		
SPT(1-	-3/8" LE B	') ACKF	FILL AND COMPLETION		NDWA		0 lbs, 30 DURING Not Re	DRIL	LING	•		DRILI		DATE	) TO	38%		OF BORING	_
Elevation (ft)	Depui (ii)	Material Graphics	Description		Sample Location Sample Number		Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
282.57 5			ASPHALT (7") (AC).  AGGREGATE BASE (5") (AB).  SILTY SAND (SM); medium dense; reddish brown moist; medium; subrounded; trace GRAVEL; rapid dilatancy; [FILL].  Poorly graded SILTY SAND (SM); medium dense reddish brown; moist; mostly medium; subrounded SILT; rapid dilatancy; becomes brown [ALLUVIUM]	; light d; few	\$\frac{1}{5}\text{0.50}}\$\frac{1}{5}\text{0.50}\$\$\frac{1}{5}\text{0.50}\$\$\$\frac{1}{5}\text{0.50}\$\$\$\$\frac{1}{5}\text{0.50}\$\$\$\$\$\$\$\frac{1}{5}\text{0.50}\$	5 2 5 6.5	6-11-11	22	18	18	18.2	6.1							
277.57 10			SILT with SAND (ML); hard; brownish gray; mostly slow dilatancy; weak cementation; few calcite sear Sandy SILT (ML); very stiff; mottled olive brown to brown; fine; some SAND; weak cementation; few calcite seams.	ms.	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	8 4 8 9.5 5 9.5	10-15-22 25-33-26 9-12-14	37 59 26	18	16	73.7	24.4					000000000000000000000000000000000000000		
272.57 15			SILTY SAND (SM); medium dense; brown; mediu subangular; some SILT; rapid dilatancy.  Sandy SILT (ML); very stiff; brownish gray variega reddish brown; wet; low plasticity; medium dry stre		S07	14	18-21-33	54	18	15	37	26.1					000000000000000000000000000000000000000		
-267 5720			low toughness.																
207.57=20	С	A gh-	LIFORNIA Speed Rail Authority	RUP H-SPEED TR	AN	E F (	REPORT TO SERVICE SERV	COL OR B ia Hi	RIDG	SE N/ Spe	AME	RED B	Υ	OSTM	/IILE	DA 2-	S(	SHEET	

Cal	ECT NA <b>iforni</b> SED BY	a Hig	h-Speed Train Fresno to Bakersfield  BEGIN DATE COMPLETION DATE	BORE	HO	IFI	OCA	TION (La	t/Long	or N	orth/	Fast a	nd Da	tum)		_   1	ROJEC   <b>315</b>     DLE   [	77-00	MBER )	
N. C	Goode	now	Oct-24-11 Oct-25-11	N21	482	215	.466	6 / E633								3	300	12R	T)/ATION	
Gre	gg/D.	Selde		IN-SIT PS I	_00	ggin										2	287.5	7 ft (	EVATION NAVD88)	
	ING MI GER(C		) ROTARY(5'-165')	DRILL Mob			)										OREH 6.25 i		NAMETER	
SAMF	LER T	/PE(S	) AND SIZE(S) (ID)					PE/HAMM			n					H			FICIENCY, ERI	_
BORE		BACKI	FILL AND COMPLETION	GROU	IND	WA		DURING			-	FTER	DRIL	LING	(DATE	E) T(	OTAL		H OF BORING	
Nea	t cem	ent g	rout	READI	NG	S		Not Re	corde	t 		N	ot Rec	orded		_   1	65 ft			$\top$
		hics			ion	er	( <b>f</b> )			(ر			Moisture Content (%)	(9)	(%) ×		Shear Strength (tsf)	ס		
on (ft)	(F)	Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	e Con	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	treng	Drilling Method Casing Depth		
Elevation (ft)	Depth (ft)	aterial			ample	ample	ample	d swo	-Value	enetra	ecove	00 Wa	oisture	quid L	asticit	rganic	lear S	Drilling Metho	Remarks/	
Ш	20 =	Σ	Description SILT (ML); very stiff; brownish gray.		ςς \ /	ഗ് S09	20	10-14-16		18	17	70	Ž	Ĕ	₫	ō	ळ	_	Other Tests	+
	=	1 1 1 1 1 1	SILTY SAND (SM); dense; brown; wet; mostly fine		- X		21.5					97.3	33.2					000000000000000000000000000000000000000		
			some SILT; slow dilatancy.	<b>5</b> ,								68.4								
																				Ē
	=																			Ė
262.57	25		SILTY SAND (SM): medium dense: gravish brown		$\frac{1}{\sqrt{2}}$	S10	25	9-8-18	26	18	18								Hydro-carbon	Ė
	SILTY SAND (SM); medium dense; grayish brown to gray mottled with brown; wet; mostly fine; little SILT; slow dilatancy; dark brown hydrocarbon contamination along 1-inch thick seam in 2 locations.																contamination. Strong smell and easily visible.			
	SILTY SAND (SM); medium dense; grayish brown to gray mottled with brown; wet; mostly fine; little SILT; slow dilatancy; dark brown hydrocarbon contamination along 1-inch thick seam in 2 locations.																		easily visible.	
	SILTY SAND (SM); medium dense; grayish brown to gray mottled with brown; wet; mostly fine; little SILT; slow dilatancy; dark brown hydrocarbon contamination along 1-inch thick seam in 2 locations.																			Ē
																				Ē
	=																			
257.57	30-					044	20	0.44.04	25	40	40								Uhadas saabsaa	
			30' grades to dense; gray to grayish brown; rapid dilatancy.		M	S11	30	8-11-24	35	18	18								Hydro-carbon contamination.	F
					Δ		31.5													Ē
	=																			Ē
7 07	=																			E
ורם <i>לו</i>	_																			
2																				Ė
252.57	35-		Poorly-graded SAND with SILT (SP-SM); medium dense; light brownish gray; wet; medium; rapid		M	S12	35	8-9-11	20	18	15									
3	=		dilatancy.		Δ		36.5					6.8								
	=																			
200																				Ė
71-5-61-0 AROT DOIN LIBRANI GED 2/2/2/2/2																		1000		Ė
																		3000000000000000000000000000000000000		Ė
247.57	40-		(continued)																	
			1					REPORT											DLE ID	
247.57								BORINO DIST.		CO JNTY		RO	UTE	F	POSTN	ЛILE		S E/	0012R \	
6	<b>(</b>	CA	LIFORNIA LIRE HMM A	RUP			F	ROJECT	ORB	RIDG	E N	AME_								
	H	ligh-	Speed Rail Authority	H-SPEED TR	PAN			Californ BRIDGE N			PF	REPAF	RED B				DA	TE	SHEET	
		•	-									. Ma			ırran		2-2	TE 20-1:	2 2 of 9	

	ECT NA fornia		h-Speed Train Fresno to Bakersfield															T NUN <b>77-00</b>		
LOGG	ED BY	•	BEGIN DATE COMPLETION DATE Oct-24-11 Oct-25-11					TION (La								Н	OLE II	)		
DRILL	ING CC	NTRA	ACTOR/DRILLER	IN-SIT	U T	EST	ING		0113	.313	۱۱) د	auUl	iai G	iiu <i>)</i>		SI	JRFA		EVATION	_
	gg/D. ING ME			PS I			g											•	NAVD88)	
			ROTARY(5'-165')	Mob			)										3.25 i		AIVIETER	
	LER TY (1-3/8		) AND SIZE(S) (ID)	1				PE/HAMM D lbs, 30			าท						AMME 38%	REFF	ICIENCY, ERI	
			FILL AND COMPLETION	GROL	JND	WA		DURING				FTER	DRIL	LING	(DATE			DEPTH	OF BORING	
Nea	t cem	ent g	rout	READ	ING	S		Not Re	cordec			No	ot Rec	orded	I	1	65 ft	: 		_
		S			n	7.	(#)						Moisture Content (%)		(%)		(tsf)			
(#)	_	Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	bl/ft)	Penetration (in)	(in)	(%) ر	Conte	Liquid Limit (%)	Plasticity Index	(%)	Strength (tsf)	Drilling Method Casing Depth		
Elevation (ft)	Depth (ft)	erial (			ple L	Λ əldı	] aldı	ns bei	N-Value (bl/ft)	etratio	Recovery (in)	200 Wash (%)	sture	id Lin	ticity	Organics (%)	ar Str	ing M	D l . /	
Ше	Jec 40	Mate	Description									200	Mois	Ligu	Plas	Org	Shear (	<del></del>	Remarks/ Other Tests	
	. =		SILTY SAND (SM); medium dense; light brownish wet; medium; some fines; rapid dilatancy.	n gray;	M	S13	40	12-12-15	27	18	17	20.0						000000000000000000000000000000000000000		Ė
	=				$\Lambda$		41.5					26.3								Ē
																				F
	$\equiv$																			E
																				Ė
242.57	45		Poorly-graded SAND with SILT (SP-SM); medium		+	S14	45	9-11-12	23	18	17									-
	$\equiv$		dense; light brownish gray; wet; medium; little SIL rapid dilatancy.	.T;	X		46.5					14	14.8							E
					$\Gamma$		40.5													E
																				Ē
	=																			
	Ξ																			
	$\exists$																			
237.57	50		SILTY SAND (SM); medium dense; reddish brown fine to medium; subrounded; little SILT; trace GR		$\bigvee$	S15	50	17-22-28	50	18	18									Ē
	=		slow dilatancy.	, (V LL,	$\Lambda$		51.5					48.5	18.5							
	$\equiv$																			-
	=																			
	=																	200		Ī
	=																			Ė
232.57	55					040		40.40.00	40	40	17									
	=		Poorly-graded SAND with SILT (SP-SM); dense; reddish brown; wet; mostly medium grained sand fines; rapid dilatancy; mostly quartz, muscovite ar		V	S16	55	16-19-23	42	18	17	8.1								
			mafic material.	iu a	$\triangle$		56.5					0.1								Ī
	$\equiv$																			
	=																			
	$\equiv$																			F
																		000000000000000000000000000000000000000		Ī
227.57	<b>-</b> 60	- 1111	(continued)																	
			(continued)				F	REPORT	TITLE										DLE ID	_
							E	BORING	3 RE	CO		ROI	UTE	F	POSTN	ЛILF			0012R	
(	> (	^ ^	LIFORNIA	ARUP				ROJECT					J.L							
		iah.	Speed Rail Authority	H-Sprin T	BASI			Californ	ia Hi	gh-	Spe	ed T		.,			1		0	_
	П	ıgıı.	Opeca Kall Adillottiy		-10'0		B	RIDGE N	UMBE	:K	PF   D	REPAR	kEDB ggi/T	· Cu	ırran		DA 2-	TE 20-12	SHEET 3 of 9	

PROJECT NAM  California	⊫ High-Speed Train Fres	no to Bakersfield														T NUM 7 <b>7-00</b>	IBER	
LOGGED BY N. Gooden	BEGIN DATE	COMPLETION DATE Oct-25-11				ATION (La 6 / E633								Н	OLE 10	)		
DRILLING CON	TRACTOR/DRILLER	00:-23-11	IN-SIT	U TE	STING		3011	0.37	, (11	ialioi	iai G	iiu)		SL	JRFAC	E ELE	VATION	
Gregg/D. S			PS L													,	IAVD88) AMETER	
AUGER(0'-	5'), ROTARY(5'-165')		Mob	il B-	-80									6	3.25 i	n		
SAMPLER TYP	E(S) AND SIZE(S) (ID)					PE/HAMN 10 lbs, 3			р					- 1	AMME 38%	R EFFI	CIENCY, ERI	
BOREHOLE BA	CKFILL AND COMPLETION		GROU READI			DURING			; A				DATE			DEPTH	OF BORING	
Neat cemer	it grout		T C C C C C C C C C C C C C C C C C C C	I	<u> </u>	Not Re	ecorde	1		N	ot Rec	oraea		1	65 ft			$\top$
Elevation (ft) Depth (ft)	Material Graphics	escription		Sample Location	Sample Number Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
60 =	Poorly-graded SAND wit reddish brown; wet; mos	h SILT (SP-SM); dense;	ranid		60 60			18	16	(4			ш.	0	0)	$\sim$	Other redte	$\pm$
222.57 65	redush brown, wet, most dilatancy, mostly quartz, mineral	muscovite and a mafic	· 		61.4		44	18	18	6.4						000000000000000000000000000000000000000		
217.57 70	mostly medium; trace fin quartz, muscovite and a	es; rapid dilatancy; most mafic mineral		X	66.	5										<u> </u>		
	Sandy SILT (ML); very d brown; subrounded; som	e SAND; slow dilatancy;		Ms	319 70	16-27-30	57	18	18									
212.57, 75	cementation; few dark m	atic partings.		Λ	71.	5				50.1	16.2							
212.57 75	SILTY SAND (SM); very red light brown, gray and SILT; trace fine GRAVEI along fissures.	I brown; wet; mostly fine;	some	S	76.±		50/3"	9	9	28.8	24.6							
C Hig	(continued	)																
						REPORT BORIN		CO	RD								LE ID 0012R	
						DIST.		JNTY		RO	UTE	Р	OSTN	/ILE		EA		
( C.	ALIFORNIA	URS   HMM	ARUP			PROJECT Califorr	nia H	igh-	Spe	ed T						-		
Hig	gh-Speed Rail Authori	CALIFORNIA HO	H-SPEED TH	AN		BRIDGE N	NUMBI	₽R		REPAR		Y . Cu	rran		DA <sup>2</sup>	TE 20-12	SHEET 4 of 9	

	ECT NA		h-Speed Train Fresno to Bakersfield													- 1		T NUI 7 <b>7-0</b> 0		
LOGG	ED BY		BEGIN DATE COMPLETION DATE Oct-24-11 Oct-25-11					TION (Lat								Н	OLE ID			
DRILL	ING CO	NTR/	ACTOR/DRILLER	IN-SIT	U T	EST	ING	,, _000	0110	.01	<i>,</i> (1)	iauUl	iui U	. iu <i>)</i>		SI	JRFAC	CE ELE	EVATION	
	gg/D. .ING ME			PS L			g											•	NAVD88)	
			ROTARY(5'-165')	Mob	il E	3-80		DE // LA B 4B 4	ED 10							6	3.25 i	n		
	(1-3/8		) AND SIZE(S) (ID)	1				PE/HAMM D lbs, 30			р					- 1	AMME 38%	K EFF	ICIENCY, ERI	
	HOLE I		FILL AND COMPLETION	GROU READI			ΓER	DURING Not Re			; A		DRIL ot Rec		(DATE		OTAL I		H OF BORING	
1100		3.1.t g	Tout .					1101.10	30.00					0.404		<u>'</u>				Т
Elevation (ft)	Depth (ft)	Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	s per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth		
Elev	Dep OS	Маtе	Description		Sam			Blows				200	Mois	Liqui	Plas	Orga	She	Drilli	Remarks/ Other Tests	
			SILT with SAND (ML); hard; multicolored brownist brown; wet; some SAND; reddish seams.	h	X	S21	81.5	20-35-49	84	18	15	74	29.3					000000000000000000000000000000000000000		
202.57	85		SILTY SAND (SM); very dense; grayish brown; w \ fine; little SILT; slow dilatancy.  SILT with SAND (ML); hard; brownish gray; wet; r SILT; low plasticity; low dry strength; low toughne; reddish brown oxidation seams in multiple location	/ mostly ss;		S22	85 86.5	16-34-62	96	18	16	73.8						000000000000000000000000000000000000000	PP: 2.5 tsf TV: 1.5 tsf	
197.57	90 =		SILTY SAND (SM); dense; grayish brown; little SI	 LT;	$\forall$	S23	90	14-12-24	36	18	18									
192.57	95		slow dilatancy.  SANDY SILT (ML); hard; grayish brown; wet; som			S24	91.5	17-30-52	82	18	16	16.2	30.1							
187 57	100		SAND; low plasticity; low dry strength; low toughn				96.5					67.8						000000000000000000000000000000000000000		
	100		(continued)																	
								REPORT T		CO	RD								DLE ID 0012R	
			LIFORNIIA D				D	DIST.	COL	INTY		RO	UTE	F	POSTN	/ILE		EA	\	
	H	_A igh-	LIFORNIA Speed Rail Authority	H-SPEED TR	RAN			PROJECT Californ BRIDGE N	ia Hi	gh-	Spe PF	ed T	RED B	Y			DA	TE	SHEET	
2			-								D	. Ma	ggi/T	Сu	ırran		2-2	20-12	2 5 of 9	

	JECT N I <b>iforni</b>		gh-Speed Train Fresno to Bakersfield															77-00	
LOGO	GED BY	,	BEGIN DATE COMPLETION DATE Oct-24-11 Oct-25-11	BORE N21	HO 48	LE L 215	OCA	TION (La 6 / E633	t/Long 0773	or N	orth/	East a	ind Da	tum) rid)		H	OLE II		
DRILL	LING C	ONTR	ACTOR/DRILLER	IN-SIT	U T	EST	ING				. (.			/		SI	URFA	CE ELE	EVATION
	egg/D. LING M			PS I			g									_		•	NAVD88) IAMETER
AU	GER(	)'-5'),	ROTARY(5'-165')	Mob					IED IE								6.25 i		IOIENOV ED:
	T(1-3/		s) AND SIZE(S) (ID)					PE/HAMM D lbs, 30			р						AMME 88%	K EFF	ICIENCY, ERI
	HOLE at cem		FILL AND COMPLETION	GROU READ			TER	DURING Not Re			G A		ORIL ot Rec		(DATE		OTAL 165 ft		H OF BORING
1100	at oon	lone g	roat					Hotric	00,000					oraca					
a a		Material Graphics			ation	nber	Sample Depth (ft)	. <u>⊑</u>	(F)	(ii)	<u>-</u>	(%	Moisture Content (%)	(%)	(%) xəp	<u> </u>	Shear Strength (tsf)	por 4	
Elevation (ft)	(#)	al Gra			Sample Location	Sample Number	le De	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	le C	Liquid Limit (%)	Plasticity Index	Organics (%)	Strer	Drilling Method Casing Depth	
Eleva	Depth (ft)	Materi	Description		Samp	Samp	Samp	Slows	N-Valu	Penet	Zecov	200 W	Moistu	-iquid	Plastic	Organ	Shear	Orilling	Remarks/ Other Tests
	100		SILTY SAND (SM); very dense; grayish brown; we some SILT; slow dilatancy; interbedded; variegate	et;	ý	S25		13-30-100		16	14		_	_			0,		
	=		dark brown parting.		Δ		101.5											000000000000000000000000000000000000000	
	] =																	1000	•
	=																		
182.57	105-		SILT with SAND (ML); very stiff; grayish brown; w		_	S26	105	14-14-13	27	18	18								
	] =		some SAND; slow dilatancy; slow dilatancy.	ei,	V				21	10	10	79.4	29.9					1000	
					$\triangle$		106.5					79.4	29.9					2000	
	=																	200	
	l																	2000	
177.57	110=		110' grades to hard; grayish brown to reddish brown	wn;	7	S27	110	24-25-56	81	18	18							000	
	=		wet; mostly medium.		X		111.5					73.3							
	l																		
	=																	000	
	=																		
	=																	1000	
172.57	115																		
	=		SILTY SAND (SM); medium dense; brown; wet; m medium; subangular; little fine SAND; little coarse		$\mathbb{N}$	S28	115	9-11-15	26	18	18								
	=		SAND; trace GRAVEL; rapid dilatancy; weak cementation.		$\triangle$		116.5					29.8							
	=																		
	] =																		
	=																		
																		3000000000000000000000000000000000000	
<b>-</b> 167.57	120	11111	(continued)															2	
			(anaoa)					REPORT			_								DLE ID_
								BORINO DIST.		CO INTY		RO	UTE	F	POST	ИILE		S EA	0012R
(	<b>a</b> (	^_	LIFORNIA JURS HMM	RUP			F	ROJECT	OR B	RIDG	SE N								
			Speed Rail Authority	H-SPEED TO	RAN		(	Californ BRIDGE N	ia Hi	gh-	Spe	ed T	rain RED B	Y			DA	TF	SHEET
		9	- Frank Hall / H					NIDGE N	OIVIBE	-K			ggi/1		ırran		2-	1E 20-12	2 6 of 9

PROJECT NAME  California High-Speed Train	Fresno to Bakersfield												1	1315	77-00	
OGGED BY N. Goodenow BEGIN DATE Oct-24-11	COMPLETION DATE	BOREH	OLE 1 8215	OCA 5.466	TION (La 6 / E633	t/Long 30773	or No 3.973	orth/l 3 (N	East a latior	nd Da nal G	tum) rid)			OLE 10	12R	
ORILLING CONTRACTOR/DRILLER		IN-SITU														EVATION
Gregg/D. Selders  DRILLING METHOD		PS Lo		ig									_		•	NAVD88)
AUGER(0'-5'), ROTARY(5'-165	5')	Mobil	B-80										(	3.25 i	in	
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")		1			PE/HAMM D lbs, 30			gc						AMME 38%	REFF	ICIENCY, ERI
BOREHOLE BACKFILL AND COMPLET	TION			TER	DURING			} A		DRIL		(DATE	<i>'</i>			H OF BORING
Neat cement grout		READIN	168		Not Re	cordec	d 		N	ot Rec	orded		1	165 ft		
Elevation (ft) Depth (ft) Material Graphics	Description		Sample Location Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
SAND; rapid dilata last 3 inches.	; very dense; wet; fine to coar ncy; moderate cementation in		\$29	120	16-16-34	50	18	18							aos bo	
	; slow dilatancy; (2-inch thick nse; reddish brown silty sand		S30	125 126.5	19-29-49	78	18	18	30.7	43.5						
57.57 130 dilatancy; light gra	ise; light brownish gray; rapid y seam 1/4-inch thick. ND (SP); dense; light brownish ounded; few fines; rapid dilate		S31	130 131.5	18-17-20	37	18	15								
Sandy SILT (ML); interbedded with g medium toughness	ı; wet; medium to fine; subrou	olastic;	S32	135 136.5	19-27-23	50	18	17	56.9	27.2					<u> </u>	
some fine SAND;	ght brownish gray; wet; little C medium plasticity; medium dry	ELAY;													2000000	PP: 1.5 tsf TV: 1.0 tsf
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,				REPORT		-0-									OLE ID
					BORINO DIST.		ECO JNTY		RO	UTE	F	POSTN	/ILE		S EA	0012R
CALIFORNI	↑ URS HMM	ARUP			ROJECT	OPP	שוחר	ZE NI	\ ∆N/I⊏							
CALIFORIAL		-	<b>A</b>		Californ	ia Hi	igh-	Spe	ed T							
High-Speed Rail Au	morify California H	IGH-SPEED TRA	N	В	RIDGE N	IUMBE	ER			RED B				DA	TE 20-12	SHEET 7 of 9

		CT NA ornia		h-Speed Train Fresno to Bakersfield															T NUM 77-00	IBER	
LOG	GE	D BY		BEGIN DATE COMPLETION DATE Oct-24-11 Oct-25-11					TION (La								Н	OLE ID			
DRI	LLIN	NG CC	NTRA	ACTOR/DRILLER	IN-SIT	UT	EST	ING	, LUJJ	5113		, (I)	ialiUl	iai G	iiu <i>)</i>		SI	JRFAC	CE ELE	VATION	_
		g/D. NG ME			PS I			g											•	IAVD88) AMETER	
				ROTARY(5'-165')  AND SIZE(S) (ID)	Mob				PE/HAMM	רם ור								3.25 i		CIENCY, ERI	
SF	PT(	1-3/8	3")		Auto	oma	atic	, 140	) lbs, 30	)-incl	n dro	-					8	38%	K EFFI	CIENCY, ERI	
		OLE E		FILL AND COMPLETION Irout	GROL READ			TER	DURING Not Re			; A		DRIL ot Rec				OTAL I		OF BORING	
														(%)		<u> </u>					$\top$
			Material Graphics			ation	nber	Sample Depth (ft)	. <b>⊑</b>	£	(in)	(-	(%	Moisture Content (%)	(%)	Plasticity Index (%)		Shear Strength (tsf)	당 달		
Elevation (ft)		(#)	al Gra			le Loc	le Nur	le Dep	per 6	/lq) ər	ration	ery (ir	ash (	ıre Co	Limit	ity Inc	ics (%	Stren	g Meth		
Eleva		Depth (ft)	Materi	Description		Sample Location	Sample Number	Samp	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moist	Liquid Limit (%)	Plastic	Organics (%)	Shear	Drilling Method Casing Depth	Remarks/ Other Tests	
	1	40		strength; medium toughness; mottled with dark re brown oxidation staining.	eddish		S33			64	18	17		_	_				_		Ŧ
		$\equiv$		g-		$\Lambda$		141.5					86.5	32.8	40	10					Ħ
		₫																			
		∃																			E
		Ξ																			E
142.5	57 1	45		SILTY SAND (SM); dense; olive brown; wet; fine; SILT; slow dilatancy; mottled with reddish brown	some	$\bigvee$	S34	145	17-22-25	47	18	16									E
		∃		oxidation partings.		X		146.5													
		∄																			
																					E
		$\exists$																			E
		∃																			
137.5	57 1	50		Sandy SILT (ML); hard; grayish brown; wet; some		-	S35	150	9-10-15	25	18	17									
		₫		SAND; slow dilatancy.	•	X	000					•••	61.8	36					000000000000000000000000000000000000000		
		Ξ				$\Gamma$		151.5													
																					E
		=																			E
		₫																			
132.5	7 1																				
132.3	"	55																			
		$\exists$																			
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132.		=																			E
1																			000000000000000000000000000000000000000		
	57 <b>-</b> 1	60		(continued)																	
				1					REPORT											LE ID	
									BORINO DIST.		CO INTY		RO	JTE	F	POSTN	ИLE		SO EA	)012R	
6		(	A	LIFORNIA LIRS HMM	ARUP			F	ROJECT	OR B	RIDG	E N	AME_								
				Constant Autority	H-SPEED TO	RAN			Californ BRIDGE N			PF	REPAF	RED B	Y			DA	TE	SHEET	
<u> </u>			_	-								D	. Ma	ggi/T	. Cu	ırran		2-2	<u>20-12</u>	8 of 9	

Cali	ifornia		h-Speed Train Fresno to Bakersfield													1	315	77-00	МВЕК <b>)</b>
	SED BY Soode	now	BEGIN DATE COMPLETION DATE Oct-24-11 Oct-25-11					TION (La 5 / E633									00°,		
DRILL	ING CC	NTRA	ACTOR/DRILLER	IN-SIT	U T	EST	ING				•			,		SI	JRFA	CE EL	EVATION
	gg/D. .ING ME			PS I			g												NAVD88) DIAMETER
AUC	GER(0	'-5'),	ROTARY(5'-165')	Mob	il B	8-80										6	3.25 i	n	
	LER TY (1-3/8		) AND SIZE(S) (ID)					E/HAMM Ibs, 30			 מו					- 1	AMME 38%	REF	FICIENCY, ERI
			FILL AND COMPLETION	GROU	IND	WAT		DURING			•	FTER	DRILI	LING (	(DATE	- 1		DEPT	H OF BORING
Nea	t cem	ent gi	rout	READI	NG	S		Not Re	cordec	i		No	t Rec	orded		1	65 ft		I
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Remarks/ Other Tests
122.57	165																		
117.57	165		Borehole terminated at a depth of 165.0' on 10/25/2011. Overdrilled hole to 165.0' for PS L For corrosion test results, see Appendix E.  Soil moisture indicated as "wet" because SPT: became wet during retrieval through rotary met drilling fluid. Soil moisture indication should no used as an indication of a potential phreatic su free groundwater table.  See Borehole Log Legend for soil classification and key to test data and sampler type.	samples thod t be rface or															
112.57																			
. 307																			
								EPORT SORING		CO	RD								OLE ID 60012R
								IST.		INTY	_	ROL	JTE	P	POSTN	/ILE		E	
0	<b>(</b>	CA	LIFORNIA JURS HMM	ARUP			P	ROJECT	OR B	RIDG	E N/	ME_	ro:						
			Speed Rail Authority	HIGH-SPEED TE	MAS			Californ RIDGE N			PF	REPAR	ED B				DA	TE	SHEET
		_	•									. Mag			rran		2-	20-1	2 9 of 9

Cali	fornia		h-Speed Train Fresno to Bakersfield	DODE			004	TION (I.e.						1		1	13157	77-0	JMBER <b>10</b>	
A. P	ED BY oling		BEGIN DATE COMPLETION DATE Oct-19-11 Oct-20-11					TION (La 3 / E633									OLE 10		۱R	
	NG CC		CTOR/DRILLER er	IN-SIT Stan				zometer											LEVATION (NAVD88)	
DRILL	NG ME	THOD	)	DRILL	RIC	<u>.</u> 3	•	_0,110,001								В	OREH	OLE	DIAMETER	
			), ROTARY(6.5'-151.5')  AND SIZE(S) (ID)	Faili SPT H				PE/HAMN	FR IC	)							1.875 AMME		FICIENCY, ERI	_
SPT	(1-3/8	3")		Auto	ma	atic,	, 140	0 lbs, 30	)-incl	n dro	•					6	68%			
	HOLE I		ILL AND COMPLETION	GROU READI			ΓER	DURING Not Re			; A		DRIL ot Rec	LING corded	(DATE		OTAL   		TH OF BORING	
													(%)		<u> </u>					T
n (ft)	t)	Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	er 6 in.	(bl/ft)	Penetration (in)	y (in)	(%) us	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	(%)	Strength (tsf)	Drilling Method	und ac	
Elevation (ft)	Depth (ft)	aterial			mple	mple	mple	Blows per 6	N-Value (bl/ft)	netrat	Recovery (in)	200 Wash (%)	oisture	juid Li	asticity	Organics (%)	Shear St	Iling \	B Remarks/	
ă		Σ	Description  Poorly graded SAND (SP); brown; moist to dry; to	ace		8 S01	Sa	BG	ź	60 60	8 60	20	Σ	<u> </u>	- E	ō	<u>က</u>		Other Tests 1" concrete	+
			SILT; fine medium SAND; trace coarse SAND; we cementation.	eak	000														pavement; garbage barrel	E
	$\exists$				000															E
					000							48.3							Modified Proctor:	Ē
					000							40.5							Max $\gamma_d = 125.5$	Ē
	=		4.0', ceramic and glass debris in cuttings.		000														Optimum W <sub>i</sub> = 9.8%	E
281.05	5—				0:00		5											}		E
201.00			Poorly graded SAND (SP); very dense; reddish by moist to dry; trace SILT; fine medium SAND; trace		M	S02	5	26-26-50	76/ 11"	17	16									E
	=	Щ	coarse SAND; weak cementation.  Poorly graded SAND with SILT (SP-SM); very det				6.5													E
	=		grayish brown with reddish brown mottling; moist; SILT; fine SAND; trace coarse SAND; weak	few	M	S03	6.5	26-19-12	31	18	14	30.8	10.1						6.5' mud tub set; 6" drag bit	E
	=		cementation.  Poorly graded SAND (SP); dense; reddish brown;	wet;			8													E
	$\equiv$		trace SILT; fine medium SAND; weak cementatio	n.	X	S04	8	37-50	50/ 3"	9	9	28.3	12					<u> </u>		E
						005	9.5	40.50	50/	- 10	-10									Ē
276.05	10		9.5', SP-SM - refer to 5.8', grades to wet brown w reddish brown mottling.	ith	X	S05	9.5	46-50	50/ 6"	12	12	65.8	23.8							
	$\equiv$		44.01.0D			S06	11	18-34-27	61	18	14							<u> </u>		
	=		11.0', SP - refer to 6.5'.  11.7', SP-SM refer to 5.8', grades to wet.		X	500		10-34-21	01	10	14	47.1	16.3							
	Ξ		12.5', grades to dense; grayish brown with			S07	12.5	21-18-19	37	18	12	65.4								Ē
	$\exists$		grayish-white mottling. All the fine content sugges	sts	X	307		21-10-19	37	10	12	75.1	18.5							Ē
	=		14.0', grades to medium dense; grayish brown wi	th		S08	14	14-11-11	22	18	12									E
271.05	15—		reddish brown and gray mottling.	uı	$\mathbb{X}$							73.9	16.2							
27 1.00							15.5													E
																				F
	∃																			F
	$\equiv$																			E
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																		<u>0000000000000000000000000000000000000</u>		Ē
266.05	20-		(continued)																	上
			(					REPORT											HOLE ID	_
								BORINO DIST.		CO INTY		RO	UTE	F	OST	ЛILE		-	S0013AR EA	
(	<b>(</b>	١Δ٢	LIFORNIA LIRS HMM	ARUP			F	PROJECT	OR B	RIDG	SE N	AME						$\perp$		
	H	iah-9	Speed Rail Authority	H-SPEED TR	MAS			Californ	ia Hi	gh-	Spe	ed T	rain RED B	Y			DA	TF	SHEET	
		-9 ·					-	איייוספ ו	OIVIDE	-11				Γ. Cu	rran		2-	20-1	12   1 of 8	

Cali LOGG A. P DRILL Pitch DRILL AUG SAMP SPT BORE Piez	ED BY oling NG CO ner/W NG ME GER(0 LER TY	A High DNTRA Bak THOD '-6.5'', (PE(S) ") BACKF		N21 IN-SIT Star DRILL Faili SPT H Auto	HAMI RIG RIG IAMI INDV	714. EST ipe 3 150 MER atic, WAT	ING piez 00 TYF 140	TION (Lat 3 / E633 zometer PE/HAMM ) lbs, 30 DURING Not Re	ER ID	.651	op G A	latior FTER N	DRILLI	LING orded	(%)	SI S	1315 DLE II SOO DREH 1.875 AMME 68% DTAL 151.5	13AI DE ELE 5 ft (I OLE D in R EFF	REVATION NAVD88) IAMETER ICIENCY, ERI	
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
261.05	25		20.0', grades to dense; grayish brown with brown mottling.  25.0', grades to grayish brown with reddish brown brown, and grayish white mottling.		X	S10	25 26.5 28	21-18-28	34	18	14	78.6	24.5					1000000000000000000000000000000000000		
256.05	30		30.0', grades to grayish brown with frequent reddibrown mottling.	ish	X		30 31.5	13-14-20	34	18	18	62.4	21.7							
			<ul><li>35.0', grades to very dense; reddish brown.</li><li>36.0', grades to grayish brown with reddish brown mottling.</li></ul>	1		S12	35 36.5	20-25-31	56	18	18	67.6						000000000000000000000000000000000000000		
<b>-</b> 246.05	40	. 1	(continued)																	_
240.03	H	CAI	LIFORNIA Speed Rail Authority	ARUP H-SPEED TH	RAN		P	REPORT TO BORING DIST. PROJECT Californ BRIDGE N	COL OR B	RIDG gh-	SE N/ Spe	AME	RED B	Y	POSTM		DA 2-:			

	ECT NA fornia		h-Speed Train Fresno to Bakersfield													- 1		T NUN <b>77-00</b>		
LOGG A. P	ED BY	ı ı ııg	BEGIN DATE COMPLETION DATE Oct-19-11 Oct-20-11					TION (La 3 / E633								Н	OLE ID			
DRILL	NG CC		CTOR/DRILLER	IN-SIT				7 2000	2311	.001	(1)	ialioi	iai G	iiu)		SI	JRFA	CE ELE	VATION	
	ner/W			Star		-	piez	zometer										•	AMETER	
AUC	ER(0	'-6.5'	), ROTARY(6.5'-151.5')	Faili	ing	150										4	1.875	in		
	LER TY (1-3/8		AND SIZE(S) (ID)					PE/HAMM D lbs, 30			g					- 1	AMME 38%	REFF	CIENCY, ERI	
BORE	HOLE I	SACKE	FILL AND COMPLETION	GROU	JND	WAT		DURING			•	FTER	DRIL	LING	(DATE	- 1		DEPTH	OF BORING	
Piez	omete	er		READ	ING	S		Not Re	cordec	i		N	ot Rec	orded		_   1	51.5	ft		$\neg$
		S			ou	-e	(#)						Moisture Content (%)		(%)		Shear Strength (tsf)			
n (ft)	£)	Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	(bl/ft)	Penetration (in)	(in)	200 Wash (%)	Cont	Liquid Limit (%)	Plasticity Index	(%)	rengtl	Drilling Method Casing Depth		
Elevation (ft)	Depth (ft)	erial			nple l	nple ľ	nple [	ws be	N-Value (bl/ft)	etrati	Recovery (in)	Was	sture	ji Dir	sticity	Organics (%)	ar St	Drilling N Casing D	Remarks/	
Ele	0e 40	Mat	Description		Sar				>- Z 36			200	Moi	Liq	Plag	Org	She	-	Other Tests	_
	$\exists$		40.0', grades to dense; reddish brown with grayis brown mottling.	sn	M	S13	40	39-18-18	36	18	18									F
					Δ		41.5					84.7	26.6					) (000)		Ē
																		000		
	=																			
																				E
	$\exists$																			E
241.05	45		Poorly graded SAND (SP); very dense; brown wi		M	S14	45	29-50	50/ 5.5"	12	11							) () ()		Ē
	=		reddish brown mottling; wet; trace SILT; fine SAI weak cementation.	ND;	Α		46.5		3.3			38	15					000		-
	₫																			Ė
																		000		E
	$\exists$																			F
	∃																			E
236.05	50																			Ē
			50.0', grades to reddish brown; fine to medium S trace coarse SAND.	SAND;	M	S15	50	18-28-33	61	18	16							000000000000000000000000000000000000000		
					Δ		51.5											200		
	=																			
	$\equiv$																	1000		
	=																			
																				Ī
231.05	55		Poorly graded SAND with SILT (SP-SM); dense;	- — — –	$\forall$	S16	55	10-19-22	41	18	14									
	=		grayish brown with reddish brown mottling; few S fine SAND; weak cementation.	SIL1;	$\Delta$		56.5					77								
	$\exists$																	200		
	$\equiv$																	000000000000000000000000000000000000000		F
	$\exists$																			
	∃																			F
226.05	60																			
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_			1150D) II 4					DIST.	COL	INTY		RO	UTE	F	POSTN	/ILE		EA		
		A	LIFORNIA LURS HMM	ARUP			P	ROJECT	OR B	RIDG ah-S	E NA	AME ed T	rain							
	H	igh-	Speed Rail Authority	GH-SPEED T	RAN			BRIDGE N			PF	REPAF	RED B	Y C,	ırran		DA	TE 20-12	SHEET 3 of 8	
											$\perp \nu$	. ıvıa	ggi/T	. UU	ıııan		Z-,	ZU-12	. <sub> </sub> ວ ປ	

	TARY(6.5'-151.5') SIZE(S) (ID)	N214 IN-SITU Stand DRILL Failir SPT HA	J TE dpip RIG ng 1 AMM mat	14.4 STIN DE P 1500 MER T tic, 1	I33 NG Diez D TYP	TION (Lat / E633 cometer PE/HAMM 0 lbs, 30 DURING Not Rec	ER ID	.651	) (N	lation	DRILL ot Rec	rid)	(DATE	1 Hu ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	1315 OLE II SOO DREH 286.0 DREH 1.875 AMME 68% DTAL	13AI CE ELE 5 ft (I OLE D in ER EFF	<u> </u>	
S Depth (ft) Material Graphics	Description				Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
221.05 65 Poor brow	, grades to very dense.  ly graded SAND (SP); dense; brown with redent mottling; trace SILT; fine to medium SAND comentation.	dish ;	X	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	1.5	12-26-27	45	18	12	71.8	24.3					<u> </u>		
	, grades to very dense; reddish brown; um-fine SAND.		X	320 7	1.5	21-29-34	63	18	18	19.4						\$6600000000000000000000000000000000000		
206.05																		
	(continued)				P	EPORT 1	ITI E									l Lic	DLE ID	
CALIFO High-Spee	ORNIA d Rail Authority	ARUP DH-SPEED TRA	AN		B D PI C	ROJECT ROJECT Californ	COU OR B	RIDG gh-S	SE NA	AME ed T	RED B	Y	POSTM		DA		0013AR	

PROJE Calif			h-Speed Train Fre	sno to Bakers	sfield														T NUN 77-00	IBER	
LOGGE A. Po	ED BY	·····g	BEGIN DATE Oct-19-11	COMPLETION DOCT-20-11	DATE B				TION (La 3 / E633								H	OLE ID			
DRILLI	NG CC		CTOR/DRILLER	OCI-20-11	II.	N-SITL	J TES	STING			.031	(1)	valioi	iai G	iiu)		SU	JRFAC	CE ELE	VATION	
Pitch						Stand ORILL F		e pie:	zomete	r									,	IAVD88) AMETER	
			), ROTARY(6.5'-15	1.5')		Failin	_		DE#1444									.875		OLEVIOY ED	
SAMPL SPT(			AND SIZE(S) (ID)						PE/HAMN 0 lbs, 3			р						AMME 88%	K EFFI	CIENCY, ERI	
BOREF			FILL AND COMPLETION			GROUN READIN		ATER	DURING Not Re			. Δ		DRIL ot Rec		(DATE	.			OF BORING	
1 1620	Jiliett	,1							Notine	Corde	,				orded	_		51.5	<u>π</u>		Т
Elevation (ft)	Depth (ft)	Material Graphics					Sample Location	Sample Depth (ft)	vs per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Damada/	
Ele	Der Oer	Mat		Description					Blows				200	Mois	Lig	Plas	Org	She		Remarks/ Other Tests	Щ
201.05	85		Poorly graded SAND w grayish brown with red SILT; fine SAND; weak 85.0', grades to brown.	dish brown mottling cementation.	very dense g; wet; few	e;	S2 S2	21 80 81.5 22 85 86.5	31-31-44	75	18	17	60.6	23					000000000000000000000000000000000000000		
	90-		Poorly graded SAND (SILT; fine medium SAN			· ·	S2	91.5		70	18	7									
186.05	95		SILTY SAND (SM); ver little SILT; trace mediu cementation.				X S2	95 96.5	32-50	50/ 4"	10	9	90.9						000000000000000000000000000000000000000		
2	.00		(continue	ed)																	
									REPORT BORIN		CO	RD								LE ID 0013AR	
			UEOB\ !! ^						DIST.	COL	JNTY		RO	UTE	F	POSTN	ИLE		EA		
		A	LIFORNIA	3	HMM ARL	UP	•	F	PROJECT Califorr	OR B	RIDG	E N/ Spe	AME ed T	rain							
	Н	ıgh-	Speed Rail Autho	rity	LFORNA HGH-S	SPEED TRA	W		BRIDGE N			PF	REPAR	RED B	Y Cu	ırran		DA <sup>2</sup>	TE 20-12	SHEET 5 of 8	

	ECT NA		h-Speed Train Fre	sno to Bakersfield													- 1		T NUN <b>77-00</b>		
LOGG	SED BY Poling	a i iig	BEGIN DATE Oct-19-11	COMPLETION DATE Oct-20-11	BORE				TION (La								Н	OLE II	)		
DRILL	ING CO		CTOR/DRILLER	OCI-20-11	IN-SIT				7 2000	2311	.03	(1)	ialioi	iai G	iiu)		_		13AF	EVATION	_
	her/W				Star		-	piez	zometer	•									•	NAVD88)	
			), ROTARY(6.5'-151	1.5')	Fail			00									- 1	1.875		AWETER	
	PLER Τ Γ(1-3/8		AND SIZE(S) (ID)						PE/HAMM D lbs, 30			าท					- 1	AMME 38%	REFF	ICIENCY, ERI	
			FILL AND COMPLETION		GROU	JND	WAT		DURING				FTER	DRIL	LING	(DATE	- 1		DEPTH	OF BORING	
Piez	zomete	er			READ	ING	S		Not Re	corde	1		N	ot Rec	orded	I	_   1	51.5	ft		$\overline{}$
		ics				uc	ē	(ft)						Moisture Content (%)		(%)		(tsf)	_		
) (ft)	G	Material Graphics				Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	(pl/ft)	Penetration (in)	(in)	200 Wash (%)	Conte	Liquid Limit (%)	Plasticity Index	(%)	Strength (tsf)	Drilling Method Casing Depth		
Elevation (ft)	Depth (ft)	erial				nple L	nple l	nple [	ws be	N-Value (bl/ft)	etrati	Recovery (in)	Was	sture	jd Lir	sticity	Organics (%)	ar St	Drilling M Casing D	Remarks/	
	De 100	Mat		Description		Sar	Saz				18 Per		200	Moi	Lig	Pla	Org	Shear	<del></del>	Other Tests	$\bot$
			trace SILT; medium fine	SP); very dense; brown; ve e SAND; weak cementat	wet; ion.	M	S25	100	17-20-30	50	18	15									E
						$\mathcal{A}$		101.5													Ē
																			000		Ė
	=																				Ė
																			1000		
181.05	105		105.0', grades to weak	moderate cementation.		М	S26	105	29-50	50/	12	11									
	=					Α		106.5		0			34.4	17.4							
	=																				E
																					E
																					Ē
	=																				E
176.05	110-																		000000000000000000000000000000000000000		
			110.0', grades to mediu	um dense fine SAND.		M	S27	110	12-12-17	29	18	15	07.4								E
						Α		111.5					67.1								Ē
	=																				F
																					E
																					E
																					Ē
171.05	115-					-	S28	115	42-50	50/	9	11									F
				wn mottling; few SILT; fin		Å		116.5		3"			54.3	26.8					000000000000000000000000000000000000000		
																					E
																					Ē
																					Ė
																					Ė
160.05	120																				F
166.05	<b>-</b> 120		(continue	d)																	
									REPORT S		.CO	ВD								DLE ID 0013AR	_
									IST.		JNTY		RO	UTE	F	POSTN	/ILE		EA		
	<b>(</b>	CA	LIFORNIA	URS HMM	ARUP			P	ROJECT	OR B	RIDO	E NA	AME_	re!:-							
	H	igh-	Speed Rail Author	rity CALIFORNA	HIGH-SPEED T	RAN			Californ RIDGE N			PF	REPAF	RED B	Y			DA	TE	SHEET	
												D	. Ma	ggi/T	. Cu	ırran		2-	20-12	2   6 of 8	

DRILLING OF PITCHER/N DRILLING OF AUGER SAMPLER SPT(1-3	ia Hig Y B CONTRA W. Bak METHOI (0'-6.5' TYPE(S /8")		N214 IN-SITI Stan DRILL Failin SPT HA	467 U TI dpi RIG ng AMI ma	714. ESTI ipe 150 MER atic,	A33 ING piez 0 TYF 140	TION (Lat 3 / E633 cometer PE/HAMM ) Ibs, 30 DURING Not Re	2311 ER ID )-inch	.651	) (N	lation	DRIL ot Rec	rid)	(DATE	1 HG SU 22 BG 4 HA (6	13157 DLE ID 300° URFAC 286.0 DREHC 1.875 AMME 58% DTAL I	77-00 13A DE ELI 5 ft (I OLE D in R EFF	
Elevation (ft)	Material Graphics	Description			Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
		Poorly graded SAND with SILT (SP-SM); very der brown; wet; fine; little SILT; weak cementation.  121.0', coarser; less fines; trace GRAVEL.	nse;		S29	120	38-41-50	91	18	00							100000000000000000000000000000000000000	Silt content may be overestimated fro 120 to end
161.05   125= - - - 156.05   130=		SILTY SAND (SM); very dense; grayish brown; w fine; interbedded SAND and SILT; some fines; we cementation.	et; eak		S31	130	14-33-50	83/ 11"	18	14	73						1000000000000000000000000000000000000	
151.05 135		SILTY SAND (SM); very dense; yellowish brown; fine; trace fines; weak cementation.  SILTY SAND (SM); very dense; yellowish brown;		<u>,                                    </u>		131.2	24-25-26	51	18	16							<u> </u>	
146.055 146.05		fine; some SILT; weak cementation.		X L	1	136.5					65						<u> </u>	
L 140.05 140		(continued)																
TO SOUTH TO	CA High-	LIFORNIA Speed Rail Authority	ARUP H-SPEED TR	AN		P (	REPORT T BORING DIST. PROJECT Californ BRIDGE N	COL OR B ia Hi	RIDG gh-S	SE NA	AME ed T	RED B		POSTN	/ILE	DA <sup>-</sup> 2-2		

	ECT NA fornia		h-Speed Train	Fresno 1	to Bakersfield															T NUN <b>77-00</b>		
LOGG	ED BY		BEGIN DATE Oct-19-1	E COM	MPLETION DATE	BORE				TION (La								Н	OLE II			
DRILL	ING CO		CTOR/DRILLER		U. EU 11	IN-SI	TU T	EST	ING			.00	. (11		iui U	/		SI	JRFA	CE ELE	VATION	
	her/W					Sta	-	-	piez	zometer										•	NAVD88) IAMETER	
AUC	SER(C	'-6.5'	), ROTARY(6.5	'-151.5')		Fail	ling	150										4	1.875	in		
	LER T\ (1-3/8		AND SIZE(S) (ID)			1				PE/HAMM D lbs, 30			gc						AMME 38%	REFF	ICIENCY, ERI	
BORE	HOLE	BACKE	FILL AND COMPLE	TION		GRO	UND	WAT		DURING	DRIL	LING					(DATE	E) TO	OTAL		OF BORING	
Piez	omete	er				READ	JING	5		Not Re	corde	t 		N	ot Rec	orded		1	51.5	ft		_
		<u>S</u>					n	ŗ.	(ft)						Moisture Content (%)		(%)		Shear Strength (tsf)			
(#)		Material Graphics					Sample Location	Sample Number	Sample Depth (ft)	per 6 in.	bl/ft)	Penetration (in)	(in)	(%) ر	Conte	Liquid Limit (%)	Plasticity Index (%)	(%)	ength	Drilling Method Casing Depth		
Elevation (ft)	Depth (ft)	erial (					J eldı	√ aldı	] aldı	vs pel	N-Value (bl/ft)	etratio	Recovery (in)	200 Wash (%)	sture	id Lin	ticity	Organics (%)	ar Str	Ing M	D l . /	
Ele	об 140	Mat		Descrip	otion		San			Blows				200	Mois	Liqu	Plas	Org	She	Drilling Casing	Remarks/ Other Tests	
			interbedded SANI	D and SILT.			M	S33	140	19-22-37	59	18	16									
							Α		141.5													
	Ξ																					
																				200		
141.05	145		SANDY SILT (ML	); hard; gray	rish brown; wet; soi	me	$\forall$	S34	145	22-24-35	59	18	13									
	Ξ		SAND; low cemer	ntation.			$\mathbb{A}$		146.5													
									140.5													
	=																					
	Ξ																					
136.05	150		SILTY SAND (SM fine; little fines; lo		e; grayish brown; v	vet;	M	S35	150	20-24-32	56	18	17							<u> </u>		
	=		-,, -				Δ		151.5													•
			Borehole terminat	ted at a dept	th of 151.5' on						•											
	=		10/20/2011. Piez For corrosion test																			
	Ξ				et" because SPT sa	amples																•
			became wet durin drilling fluid. Soil	ig retrieval tl moisture inc	hrough rotary metholication should not	od <sup>°</sup> be																
131.05	155		used as an indica free groundwater		ential phreatic surfa	ace or																
	=				soil classification of	chart																
			and key to test da	ita and sam	pier type.																	
	=																					
	$\equiv$																					
126.05	160																					_
										REPORT T											DLE ID	_
										BORINO DIST.		CO JNTY		RO	UTE	P	POST	ИILE		EA	0013AR	
C	<b>(</b>	Δ	LIFORNI	Δ	URS HMM	ARUP			P	ROJECT	OR B	RIDO	SE NA	AME								
			Speed Rail Au		GALIFORNIA H	IGH-SPEED T	TRAN			Californ	ia H	gh-	Spe	ed T	rain RED B	Y			DA	TF	SHEET	
		J		,						DOL IV	الانت	`				<u>. Cu</u>	ırran		2-	20-12	8 of 8	

	forni	a Hig		esno to Bakersfield	DODE		1.00	TION (L	10			F				_   1	1315	77-0	IMBER O
	oode	now	BEGIN DATE Oct-20-11	COMPLETION DATE Oct-21-11				ATION (La 1 / E633								3	OLE 10	14A	
			CTOR/DRILLER acken		IN-SIT	U TES	STING												EVATION NAVD88)
DRILLI	ING ME	ETHOD			DRILL		20									В	OREH	OLE I	DIAMETER
			AND SIZE(S) (ID)		SPT H	AMM	ER TY	PE/HAMM								H			FICIENCY, ERI
	(1-3/8		FILL AND COMPLETION					0 lbs, 30			-	FTER	DDII	LING	/DATE		38%	NEDT	H OF BORING
	t cem				READ		AILIN	Not Re			, ,		ot Rec		`	′ I	31.5 f		TO BONING
		ςς					æ						ıt (%)		(%)		(tst)		
Œ		Material Graphics				Sample Location	Sample Depth (ft)	6 in.	)/ft	n (in)	(in)	(%)	Moisture Content (%)	it (%)	Plasticity Index (%)	(%	Shear Strength (tsf)	Drilling Method	
Elevation (ft)	Depth (ft)	rial G				ple Lo	ple De	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	ture	Liquid Limit (%)	icity I	Organics (%)	ır Stre	Jg Me	5 1
Elev	Dept	Mate	[	Description		Sam	Sam	Blow	N-Va	Pene	Reco	200 \	Mois	Liqui	Plast	Orga	Shea	Drillir	Remarks/ Other Tests
		000	ASPHALT (7") (AC).  AGGREGATE BASE (	O"\ (AP\		5000 1000	01 0			60	60							{	
	Ξ	000 000 1111		f; brown; moist; [ALLUVIU	IM1	000													
	=		OANDT OILT (INL), SIII	i, brown, moist, [ALLOVIO	ivij.	2020												$ \{\} $	
	=					000						67.7						}	
						30.0													
	5					2003	5												
280.42	_					S	)2 5	5-6-6	12	18	18								
	=					X	6.5					53.5	17.4					000	
	<u> </u>		SILTY SAND (SM); me	edium dense; grayish brow some SILT; rapid dilatanc	n with	So	3 6.5	7-9-7	16	18	16	-						) (1)	
			brown motting, moist,	Some OLT, rapid dilatano	у.	М	8					40.9	14.9					2000	
						S	04 8	6-8-9	17	18	15							) (1)	
							9.5					44.4	16			1.9		2000	
275.42	10-		SANDY CLAY (CL); sti some fine SAND; few scementation.	ff; brown with white seams SILT; slow dilatancy; weak	s;	So	9.5	4-6-7	13	18	18	59.1	21.3	27	10	_			
			SILTY SAND (SM); me rapid dilatancy.	edium dense; brown; little s	SILT;	So		5-8-9	17	18	14	29.7	14.9					$\triangleright$	S06 and S07 contains pinkish red contaminant
	<u> </u>		SANDY CLAY (CL); ve	ery stiff; brown; some SAN	 D.	So	12.5		18	18	16								along seams and partings
	Ξ					<u>A</u>	14					58.9	21.4	65	49	3.4			
	Ξ		SILTY SAND (SM); me SILT; rapid dilatancy.	edium dense; brown; wet; I	little	So	08 14	7-11-12	23	18	15	21.6						0000	S08 contains the contaminant throughout
270.42	15					Н	15.5	i											sample Silt lens from 14.3' - 14.5' and
	=																	2000	14.5 - 14.5 and 14.6' - 14.8'
	Ξ																		
	=																		
																		000	
265.42	_20	1411	(continue	ed)															1
				-				REPORT											OLE ID
								BORINO DIST.		JNTY			UTE	F	POST	ИILE		E	80014AR A
	<b>(</b>	CAI	LIFORNIA	URS HMM	ARUP		-	PROJECT	OR B	RIDO	E N	AME_							
	H	ligh-	Speed Rail Autho	rity CALFORNA H	GH-SPEED TO	RAN		Californ BRIDGE N			PF	REPAF	RED B				DA	TE	SHEET
		_	-									. Ma			ırran		2-	20-1	2 1 of 5

	ECT NA		h-Speed Train Fresno to Bakersfield													- 1		T NUN <b>77-00</b>		
LOGG	ED BY		BEGIN DATE COMPLETION DATE Oct-20-11 Oct-21-11					TION (La								Н	OLE II			
DRILL	ING CO	NTR/	ACTOR/DRILLER acken	IN-SIT				I / E633	<del>+</del> 123	,,,,	(146	auoria	ai Gil	u)		SI	JRFA	CE ELE	VATION NAVD88)	
DRILL	ING ME	THO	)	DRILL														,	IAMETER	
			ROTARY(5'-81.5')  AND SIZE(S) (ID)	Mot				PE/HAMN	IFR ID	)							3.75 i		ICIENCY, ERI	
SPT	(1-3/8	3")		Auto	om	atic	, 140	0 lbs, 30	)-incl	n dro						8	38%			
	HOLE I		FILL AND COMPLETION rout	GROU READ			TER	DURING Not Re			3 <i>F</i>		DRIL ot Rec		(DATE	<i>'</i>	OTAL 31.5 f		OF BORING	
		5											(%)					Ì		$\top$
		phics			ation	per	th (ft)	Ë	E.	<u>[i</u>	_	(9)	Moisture Content (%)	(%)	Plasticity Index (%)		Strength (tsf)	ا م		
Elevation (ft)	(#)	Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	- Co	Liquid Limit (%)	ty Ind	Organics (%)	Streng	Drilling Method Casing Depth		
levati	Depth (ft)	ateria	December 2		ample	ample	ample	swo	-Valu	enetra	есоле	00 Wa	oistur	quid I	lastici	rganic	Shear (	Drilling N	Remarks/	
Ш	_20 <u> </u>	≥	Description		(Ñ	S09		6-9-10	19	18	15	N	Σ		<u>a</u>	0	S	_	Other Tests	$\pm$
	Ξ				X		21.5					43.8	8.2							E
							20													E
																				Ē
																				E
	=																			
260.42	25—																			Ė
200.42	25		25.0', grades dense.		$\bigvee$	S10	25	10-17-15	32	18	14	05.0								E
					$\wedge$	1	26.5					25.3								E
																				E
	Ξ																			
																				E
																				F
255.42	30 =		SAND with SILT (SP-SM); medium dense; reddis		-	S11	30	9-12-14	26	18	14	1								E
	=		brown; wet; medium SAND; rapid dilatancy.		X		31.5					6	12.3					000000000000000000000000000000000000000		
							31.5													Ė
	Ξ																			F
	_																			E
																				E
250.42	35		SILTY SAND (SM); very dense; reddish brown; medium SAND; some SILT; rapid dilatancy; weak		$\overline{}$	S12	35	56-18-18	36	18	18									Ē
	Ξ		cementation.	•	$\mathbb{N}$		36.5					33.9	12							
	Ξ																			Ė
250.42																		000000000000000000000000000000000000000		E
																				E
																				E
<b>-</b> 245.42	40-																			
			(continued)				l r	CDODT:	רודי ר									1110	N.E.ID	
							E	REPORT S	3 RE									S	DLE ID 0014AR	
		- A	LIFODA II A					DIST.		JNTY			UTE	F	POSTN	/ILE		EA		
			LIFORNIA URS IHMM	ARUP			F	PROJECT Californ	OR B	RIDO gh-	Spe	AME ed T	rain							
	Н	igh-	Speed Rail Authority	H-SPEED T	RAN			BRIDGE N			PF	REPAR ). Ma	RED B	Y	ırran		DA 2-	TE 20-12	SHEET 2 of 5	
243.42												. IVIU	<u> </u>	. 00	uil			12	. , _ 5, 0	_

Califo	CT NA <b>ornia</b>		h-Speed Train Fr	esno to Bakersfie	ld												1	315	CT NUI <b>77-00</b>		_
LOGGE N. Go	oder	_	BEGIN DATE Oct-20-11	COMPLETION DAT Oct-21-11					TION (La / E633								5		14Al		
DRILLIN Grego			CTOR/DRILLER acken		IN-SIT	ГUΤ	EST	ING												EVATION NAVD88)	
DRILLIN	IG ME	THOE			DRILL			١									ВС	DREH	IOLE D	IAMETER	
			AND SIZE(S) (ID)		SPT F	HAM	MEF	R TYF	PE/HAMIV									3.75 AMME		ICIENCY, ERI	-
SPT(			TILL AND COMPLETION	N					) lbs, 30				ETER	R DRIL	LING	(DATE		38%	DEDTI	H OF BORING	_
Neat					READ				Not Re			, ,		ot Rec		(D/ (TE	' I	1.5		TOT BOTTING	_
Elevation (ft)	Depth (ft)	Material Graphics		Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	6
	40		SANDY CLAY (CL); h SAND; medium plasti	nard; reddish brown; som	ne fine		S13		11-19-31		18	17		_				•			-
240.42	45					M	S14	41.5	14-16-21	37	18	18	60.8	16.9	30	19			$\overline{\mathfrak{o}\mathfrak{g}\mathfrak{g}\mathfrak{g}\mathfrak{g}\mathfrak{g}\mathfrak{g}\mathfrak{g}\mathfrak{g}\mathfrak{g}g$		
235.42	50			ense; reddish brown; wit	h iron		S15	46.5	7-18-20	38	18	17	55.2	16.4	28	17					
	555		oxide staining.	orse, redustriblewit, wie		X		51.5	. 10 20				42.1	19.3							
			55.0', grades very dei	nse; trace fine gravel.			S16	55 56.5	14-25-36	61	18	15								Gravel experienced fror 55.0' - 55.6'	nr
225.42₩	UU		(continu	red)																	
			UEOD: " 1					D	EPORT BORING	G RE	JNTY			UTE	F	POSTN	ИILE			OLE ID 0014AR	_
<b>7</b>	Н	A igh-	LIFORNIA Speed Rail Autho	ority CALFORN	M ARUP	RAN			ROJECT Californ RIDGE N	ia Hi	gh-	Spe PF	ed T	rain RED B ggi/T		rran		DA 2-	TE 20-12	SHEET 2 3 of 5	5

	ECT NA		h-Speed Train Fres	sno to Bakersfield															T NUN <b>77-00</b>		
LOGG	ED BY	•	BEGIN DATE Oct-20-11	COMPLETION DATE Oct-21-11					TION (Lat								Н	OLE IE			
DRILL	ING CC	NTR/	ACTOR/DRILLER acken	OUL 2 1-1 1	IN-SIT				, L000	F1 ZU	1	(140	4 LI UI IC	ai UII	<b>ω</b> ,		SL	JRFA	CE ELE	X EVATION IAVD88)	
	ING ME		) ROTARY(5'-81.5')		DRILL												- 1			AMETER	
			AND SIZE(S) (ID)		SPT H	IAMI	MER	TYF	PE/HAMM									3.75 i		CIENCY, ERI	
	(1-3/8		FILL AND COMPLETION						DURING				ETED	DRILI	ING	/DATE		38%	DEDTL	OF BORING	
	t cem				READ			LIX	Not Re					ot Rec		(DATE		1.5 f		TOT BOTTING	
Elevation (ft)	Depth (ft)	Material Graphics				Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/	
ă	-60 <u> </u>	ĕ ∏∏		escription d; reddish brown with gray	,		817 S17	eS 60	17-26-36	5 62	18	26 18	20(	Ψ	Pi	<u>R</u>	ŏ	જ	-	Other Tests	_
			mottling; some fine SAN cementation.	n, reddish brown with gray ND; no dilatancy; weak	/	M	317	00	17-20-30	02	10	10	05.0	24.0							E
220.42	65				<del></del>			61.5	20.00.00	- 00	10	18	65.6	24.2					000000000000000000000000000000000000000		
215.42	70		gray mottling; some SIL	/ dense; reddish brown wi T; weak cementation.	itn	X		61.5	22-30-30	60	18		37.1						000000000000000000000000000000000000000		
210.42	75		SANDY SU T (MI) > borr	d; red and grayish brown;		X	S19 S20	71.5	19-28-37	41	18	17	49.8	14.9					>		
210.42 -205.42				, led and grayish brown, ibrounded GRAVEL; slow		X		76.5		•			58.5	22.7					000000000000000000000000000000000000000		
205.42	-00		(continue	a)																	
								E	EPORT T	3 RE		RD							S	LE ID 0014AR	
								D	IST.	COL	INTY		RO	UTE	P	POSTN	/ILE		EA		
	H	_A igh-	LIFORNIA Speed Rail Author	ity CALFORNA HO	ARUP SH-SPEED TO	RAN		C	ROJECT Californ RIDGE N	ia Hi	gh-S	Spe	ed T	rain RED B' ggi/T	Y C	ırror		DA	TE 20-12	SHEET 4 of 5	
												$\perp \nu$	. ivid	yyı/ I	. Uu	ıııdıl		Z-	∠U- I∠	.   <del>+</del> UI 3	

	ECT NA <b>fornia</b>		h-Speed Train Fresno to Bakersfield														315		JMBER O	
LOGG		_	BEGIN DATE COMPLETION DATE Oct-20-11 Oct-21-11					TION (Lat								Н	SOO	)		
DRILLI	NG CC	NTR/	ACTOR/DRILLER	IN-SIT				7 2000	7720		(140	itiona	011	α,		SL	JRFA	CE EL	EVATION	
_	gg/D. I NG ME		acken	DRILL	DIC														(NAVD88) DIAMETER	
			ROTARY(5'-81.5')	Mob													3.75 i		DIAIVIETER	
			) AND SIZE(S) (ID)	1				PE/HAMM D lbs, 30			'n					- 1	AMME 38%	REF	FICIENCY, E	₹i
	(1-3/8 HOLE E		FILL AND COMPLETION	GROL	JND\	NAT		DURING			-	FTER	DRIL	LING (	(DATE			DEP1	H OF BORIN	G
Neat	ceme	ent g	rout	READ	ING:	S T		Not Re	cordec	i		No	t Rec	orded		8	1.5 f	t	T	
		S			_	ا ي	Œ						Moisture Content (%)		(%)		(tst)			
Œ		iraphi			ocatio	nmbe	epth (	per 6 in.	ol/ft)	(in)	(ii	(%)	Sonte	iit (%)	ndex	(%)	ength	sthod	5	
Elevation (ft)	Depth (ft)	Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	s per	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	ture (	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	<u> </u>	
Ele	Dep	Mate	Description		_			Blows			_	200	Mois	Liqu	Plas	Orga	She			sts
	-00				M	S21	80	26-37-39	76	18	16								1/4 inch thick laminations fi	
	=				Δ		81.5											000	80.0' - 80.5'	
	=		Borehole terminated at a depth of 81.5' on 10/21/ Conducted SPT Sampling on 5 foot intervals with																	F
	Ξ		exception of continuous sampling from 5.0 to 15.4 Mud Rotary was used to create a 3 3/4 inch hole	5 feet.																
	Ξ		a claw drag bit. The borehole was backfilled usin cement grout to the satisfaction of the City of Fre	g neat																Ė
	Ξ		grouting inspector.																	F
200.42	85—		For corrosion test results, see Appendix E.																	F
	85   90   90		Soil moisture indicated as "wet" because SPT sail became wet during retrieval through rotary method	od <sup>*</sup>																
	Ξ		drilling fluid. Soil moisture indication should not bused as an indication of a potential phreatic surfa																	
			free groundwater table.  See Borehole Log Legend for soil classification of	hart																Ē
	=		and key to test data and sampler type.	iait																-
	$\equiv$																			Į
	Ξ																			F
195.42	90-																			Ē
	=																			E
	Ξ																			Ę
	Ξ																			F
	Ξ																			Ē
	=																			E
190.42	95																			
																				F
	Ξ																			F
	=																			Ė
	_																			į
	_=																			F
																				F
<b>-</b> 185.42	100																			
190.42 -185.42								REPORT 1											OLE ID	
								BORINO DIST.		CO	RD	ROI	JTE	P	OSTN	/ILE		S	80014AR A	
(	<b>(</b>	Δ.	LIFORNIA LIESTHAM	ARUP				ROJECT			F N4									
			Speed Rail Authority	PH-SPEED TO	RAN			Californ BRIDGE N	ia Hi	gh-S	Spe	ed T		v			DA	TE	CLIFFT	
	- ''	9	opout num romony					KIDGE N	ONBE	-rx		. Ма			rran		2-	TE 20-1	SHEET 5 of	5

PROJECT NAME  California Hig	h-Speed Train Fre	sno to Bakers	field	101.51	004	TION // -	1/1		- 11-1			1		1	315	77-00	MBER )
N. Goodenow	BEGIN DATE Oct-20-11	COMPLETION D Oct-20-11	N214	5253	.122	TION (La 2 / E633								8		14R	
DRILLING CONTRA Gregg/D. McM	acken		IN-SITU	J TEST	ING									- 1			EVATION NAVD88)
DRILLING METHOR AUGER(0'-5'),	ROTARY(5'-81.5')		DRILL F		)										OREH 3.75		DIAMETER
SAMPLER TYPE(S			SPT HA	MMEF	RTYF	PE/HAMM			nn.					H/			FICIENCY, ERI
SPT(1-3/8") BOREHOLE BACK	FILL AND COMPLETION		GROUN	NDWA		DURING			-	FTER	DRIL	LING	(DATE			DEPT	H OF BORING
Neat cement g	rout		READIN	NGS		Not Re	cordec	i		N	ot Rec	orded		8	31.5	ft 	
Elevation (ft)  Depth (ft)  Material Graphics		Description		Sample Location Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
	ASPHALT (7") (AC).  AGGREGATE BASE (9	)"\		S01	0			60	60								
	SANDY SILT (ML); bro	wn; moist; some me	edium SAND;	20:02													
	trace GRAVEL; [ÁLLU	VIUM].		200													
				2020						53.7							
				20:02													
279.57 5			ith raddiah	S02	5	3-3-3	6	18	18							[]	
	SILTY SAND (SM); loo brown mottling; moist; rapid dilatancy.	mostly fine SAND; li	ittle fines;			3-3-3	"	10	10	17.5	7.5						
	6.5', grades very dense	9.		/ \ \	6.5	3-7-36	43	18	16								
				$\mathbb{X}$	8					21.5	11.1						Moderately
	SANDY SILTY CLAY (	CL-ML); hard; brown ne SAND: little SILT:	n with white	S04	8	30-22-23	45	18	16								cemented from 7.5' - 9.0'
	dilatancy; weak cemen	tation.		Δ	9.5					53.9	19.9	21	5				
274.57	SILTY SAND (SM); loo mostly fine SAND; som cementation.	se; brown with white ne fines; slow dilatar	e seams; ncy; weak	S05	9.5	4-3-5	8	18	15	47.2	16.5						
		stiff; grayish brown	n; little fine	S06		3-4-6	10	18	15	70.6/	19.3/	28	12				
	SANDY SILT (ML); ver	y stiff; grayish brow	n; wet; low	S07	12.5 12.5	5-10-13	23	18	17	15	19.3					1000000000000000000000000000000000000	
	toughness.		ļ	$\bigvee$	14					59	20.1						
269.57 15				S08	14	7-11-13	24	18	14	60.0							
269.57			Y		15.5					60.2							
																<u> </u>	
																<u> </u>	
264.57—20————	(continue	ed)					_								_		
						REPORT TO		CO	RD								OLE ID 0014R
		_				DIST.		INTY		RO	UTE	F	POSTN	ЛILE		EA	
	LIFORNIA	3	HMM ARUP			ROJECT					rain						
W High-	Speed Rail Autho	rity	FORNIA HIGH-SPEED TRA	M		BRIDGE N			PF	REPAF	RED B ggi/T		rror			TE 20-1	SHEET 2 1 of 5

	ECT NA		h-Speed Train Fre	sno to Bakersfiel	d												- 1		77-00	MBER 1	
LOGG	ED BY	_	BEGIN DATE Oct-20-11	COMPLETION DATE Oct-20-11	BORE				TION (La								Н	OLE ID	)		
DRILL	ING CC	NTRA	CTOR/DRILLER	OCI-20-11	IN-SIT				1 6000	3704	.042	- (11	valioi	iai G	iiu)		SI	JRFA		EVATION	
	gg/D. ING ME		acken		DRILL	DI	G												,	NAVD88) DIAMETER	
AUC	SER(0	'-5'),	ROTARY(5'-81.5')		Mok			)									3	3.75 i	n		
	LER T\ (1-3/8		AND SIZE(S) (ID)						PE/HAMM D lbs, 30			ac					- 1	AMME 38%	REFF	FICIENCY, ERI	
BORE	HOLE I	SACKE	ILL AND COMPLETION		GROU	JND	)WA		DURING	DRIL	LING					(DATE	E) T(	OTAL		H OF BORING	
Nea	t cem	ent gi	out		READ	ING	55		Not Re	cordec	i 		N <sub>1</sub>	ot Rec	orded	Ι	8	31.5 f	<u>t</u>		$\neg$
		Sign				on	e	(ff.)			_			Moisture Content (%)	<u> </u>	(%) >		Strength (tsf)			
n (ft)	æ	Material Graphics				Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	(bl/ft)	Penetration (in)	(in)	200 Wash (%)	Cont	Liquid Limit (%)	Plasticity Index	(%)	rengt	Drilling Method Casing Depth		
Elevation (ft)	Depth (ft)	terial				nple l	nple !	nple [	ws be	N-Value (bl/ft)	netrati	Recovery (in)	) Was	sture	j bir	sticity	Organics (%)	Shear St	Drilling N	Remarks/	
Ele	-20	Z S	SILTY SAND (SM); me	Description	ray ii yarati	Sar	Sar		9-9-10	7 2 19	18 18	کو 14	200	Mo	Ę	Pa	o o	She		Other Tests	4
	=		some SILT; slow dilatar		ray; wet;	X	509	20	9-9-10	19	10	14									
							y	21.5													Ī
	Ξ																				
	=																		100		
																			<u>0000000000000000000000000000000000000</u>		
259.57	25		SILTY SAND (SM); me		  ray; wet;	+	S10	25	8-12-15	27	18	17									
	Ξ		subrounded; some SILT	Γ; rapid dilatancy.		X		26.5					43.9	12.6							
							Y	20.0											000		
	=																				
	_																		<u> </u>		
	=																				
254.57	30 =		Poorly graded SAND (S brown; wet; medium; so			$\nabla$	S11	30	6-7-9	16	18	14									
	=		brown, wet, mediam, sc	ome line oallo, trace in	163.	Δ	,	31.5													
	=																		>		
	Ξ																				
	=																		<u> </u>		
249.57	35																				
45.57	33		SANDY CLAY (CL); har medium SAND; low plan			M	S12	35	13-17-22	39	18	18								PP: 4.5 tsf TV: 2.5 tsf	
	=					Λ	V	36.5					60.5		27	12					
	=																				
	=																				
																					•
	=																		3000000000000000000000000000000000000		
244.57	40-																		<u>Q</u>		
			(continue	d)				1 =	SEDORT -										1	21 E 10	
								E	REPORT BORING	3 RE									S	OLE ID 0014R	
			UE						DIST.	COL	INTY		RO	UTE	F	POST	MILE		EA	A	
	<b>(</b>	A	LIFORNIA	URS HMM	ARUP			F	ROJECT Californ	OR B	RIDG ah-S	E NA	AME ed T	rain					,		
	H	igh-	Speed Rail Author	rity CALFORNA	HGH-SPEED T	RAN			RIDGE N			PF	REPAF	RED B	Y C.	ırror		DA	TE	SHEET 2 of 5	
												עו	. Ma	yyı/ I	. Ul	ıııdli		Z-,	20-12	2   2 of 5	

	ECT NA		h-Speed Train Fresno	to Bakersfield															T NUN <b>77-00</b>		
LOGG	ED BY	_	BEGIN DATE C	OMPLETION DATE Oct-20-11					TION (La 2 / E633								Н	OLE II	)		
DRILL	ING CO	NTR/	CTOR/DRILLER	JCI-20-11	IN-SIT				1 6000	3704	1.042	2 (1)	valioi	iai G	iiu)		SI	JRFA		EVATION	_
	gg/D. ING ME		acken		DRILL	RIC	ì												•	NAVD88) IAMETER	
AUC	SER(C	'-5'),	ROTARY(5'-81.5')		Mob	il E	8-80										3	3.75 i	n		
	LER T\ (1-3/8		AND SIZE(S) (ID)						PE/HAMM D lbs, 30			р						4MME 38%	REFF	ICIENCY, ERI	
BORE	HOLE	BACKE	TILL AND COMPLETION		GROL READ			ER	DURING			i A				(DATE				OF BORING	
Nea	t cem	ent g	out		TILLI	П			Not Re	corae	1		N	ot Red	oraea		8	1.5 f	t 		Т
		hics				ion	Je.	(ft)	ين ا		5			Moisture Content (%)	(9)	(%) ×		Strength (tsf)	ال		
on (ft)	Œ	Material Graphics				Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Son	Liquid Limit (%)	Plasticity Index	Organics (%)	treng	Drilling Method Casing Depth		
Elevation (ft)	Depth (ft)	aterial				mple	mple	mple	d swc	Value	netra	cove	0 Wa	oisture	did L	asticit	ganic	Shear S	Drilling N Casing [	Remarks/	
ш	ص 40 <u> </u>	≚	Desc SILTY SAND (SM); medium	ription n dense: reddish brow	n: wet:		S13		<u>5</u> -4-7	11	18	17	70	ğ	<u> </u>	Ĕ	ŏ	<u>က</u>	<del></del>	Other Tests	+
	=		some CLAY; medium plasti		.,,	X		41.5					47.9	22.7					000000000000000000000000000000000000000		Ē
						$\mathcal{L}$		41.5													E
																					Ē
	=																				-
																					E
239.57	45		45.0', increasing fines conto	ent.		M	S14	45	4-6-8	14	18	17									Ī
	Ξ					$\mathbb{N}$		46.5					49.4		28	17					Ė
	Ξ																				Ė
	Ξ																				Ē
	Ξ																				Ė
234.57	50—					$\downarrow \downarrow$	045	50	40.05.00		40	18									
			SANDY SILT (ML); hard; sl oxidized staining; wet; som cementation.		brown	M	S15	50	16-25-26	51	18	18									
			cementation.			Δ		51.5					59.5	33.5	33	2					Ī
	=																				
	=																				
229.57	55 =		SILTY CLAY with SAND (C	L-ML); hard; brownish	 n gray;	$\forall$	S16	55	12-20-47	67	18	17									
	=		wet; little fine SAND.			X		56.5					75.1	29.4	27	5					
	=																				
																			000000000000000000000000000000000000000		
229.57	=																				Ė
224 57																					
-LL4.J1	-00-		(continued)																		
<b>224.31</b>									REPORT :		CO	RD								DLE ID 0014R	
									DIST.		JNTY		RO	UTE	F	POST	MILE		EA		
	<b>(</b>	CA	LIFORNIA	URS HMM	ARUP			P	ROJECT	OR B	RIDG	SE N	AME	rain							_
	H	igh-	Speed Rail Authority	CALIFORNIA HI	SH-SPEED TO	RAN			BRIDGE N			PF	REPAR	RED B	Y			DA	TE	SHEET	
												<u> </u> D	. Ma	ggi/⊺	. Cι	ırran		2-	20-12	2   3 of 5	

	ECT NA		h-Speed Train Fres	no to Bakersfield													- 1		T NUI	
LOGG	ED BY		BEGIN DATE Oct-20-11	COMPLETION DATE Oct-20-11					TION (Lat								Н	OLE ID		<u> </u>
DRILL	ING CO	NTR/	ACTOR/DRILLER acken	JGI-20-11	IN-SIT				. / _000	0104	.042	- (1)	auul	iai U	iiu)		SI	JRFA	CE ELI	EVATION NAVD88)
DRILL	ING ME	THO	)		DRILL												В	OREH	OLE D	IAMETER
			ROTARY(5'-81.5') ) AND SIZE(S) (ID)		SPT F	IAM	MER	TYF	PE/HAMM									3.75 i AMME		FICIENCY, ERI
	(1-3/8		FILL AND COMPLETION						) lbs, 30			-	CTCD	DDII	LINO	/DATE		38%	DEDTI	H OF BORING
	t cem				READ	ING	S S	EK	DURING Not Re			, <i>P</i>		ot Rec		(DATE	<i>'</i>	31.5 f		H OF BORING
Elevation (ft)	Depth (ft)	Material Graphics				Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/
Ш	_60 <u></u>	Σ	De SAND with SILT (SP-SM	scription ); dense; brownish gray;	wet;		တိ S17	ගි 60	<u>m</u> 13-16-19	2 35	18	گ 14	20	Š	Ĕ	<u> </u>	ō	ळ		Other Tests
210.57			few SILT; rapid dilatancy	, dense, brownish gray,	wet,	X		61.5	13-10-13	33	20	t .	11.1						000000000000000000000000000000000000000	
219.57	65		SILTY SAND (SM); dens some fines.	e; mottled reddish brown	n; wet;	M	S18	65	11-19-24	43	18	15								
						/ \		66.5					37.8						000000000000000000000000000000000000000	
214.57	70		70.0', grades very dense			X	S19	70 71.5	16-29-38	67	18	17								
209.57	75		75.0', grades mottled red	with grayish brown.		$\bigvee$	S20	75	10-39-50	89/ 9"	15	15								Reached refusal at 50 blow
209.57						X		76.5		9									000000000000000000000000000000000000000	at 50 blow counts; 3.25" left to drive
204.37	-50-		(continued)	)																
									EPORT 3		CO	RD								OLE ID 0014R
									IST.		INTY		RO	UTE	F	POSTI	ЛILE		EA	1
	) H	A iah-	LIFORNIA Speed Rail Authori	URS HMM	ARLIP SH-SPEED TO	RAN			ROJECT Californ	ia Hi	gh-	Spe	AME ed T		v '			DA	TE	SHEET
		9	-p nem nomon	,					I JOUE IV	OIVIDE	-1 \	D	. Ma	ggi/T	<u>.</u> Cu	ırran		2-2	20-12	2 4 of 5

	ECT NA <b>forni</b> a		gh-Speed Train Fresno to Bakersfield														ROJE(   <b>315</b>		JMBER <b>0</b>	
LOGG	ED BY	_	BEGIN DATE COMPLETION DATE Oct-20-11 Oct-20-11	BORE				TION (Lat 2 / E633								Н	OLE II	)		
			ACTOR/DRILLER	IN-SIT				2 / =033	3704	.042	. (11	allon	ai G	iiu)			JRFA		EVATION	
			lacken													2	284.5	7 ft	(NAVD88)	
	ING ME SER(0		D ROTARY(5'-81.5')	DRILL			)										OREH 3.75 i		DIAMETER	
			s) AND SIZE(S) (ID)					PE/HAMM	IER ID	)						_			FICIENCY, ERI	_
	(1-3/8							0 lbs, 30			-						38%			
	HOLE I		FILL AND COMPLETION Irout	GROL READ			ER	DURING Not Re			Α	FTER No	DRILI ot Rec		(DATE	1	OTAL 31.5 f		TH OF BORING	
		- J													_					Т
		hics			ion	er	(ff)	۔		<u></u>			Moisture Content (%)	(%)	Plasticity Index (%)		Shear Strength (tsf)	اح		
L (#)	æ	Grap			ocat	Vumk	Jepti	per 6 in.	(bl/ft)	i) uo	(in)	%) y	Con	nit (9	- Inde	(%)	rengl	letho		
Elevation (ft)	Depth (ft)	Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	ws be	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	sture	Liquid Limit (%)	sticity	Organics (%)	ar St	Drilling Method	Domorko/	
Ше	Der	Mat	Description		San			Blows				200	Moi	Liqu	Plas	Org	She		Remarks/ Other Tests	
					M	S21	80	27-50-90	140	18	18							MMMM		F
	$\equiv$				M		81.5												Possible hematit	te E
	₫		Borehole terminated at a depth of 81.5' on 10/20	)/2011.				•											staining	1
	$\exists$		For corrosion test results, see Appendix E.																	
	85		Soil moisture indicated as "wet" because SPT sa	amples																Ē
	$\equiv$		became wet during retrieval through rotary meth drilling fluid. Soil moisture indication should not	be																E
	_ =		used as an indication of a potential phreatic surf free groundwater table.	ace or																þ
199.57	85		See Borehole Log Legend for soil classification of	chart																Ē
	=		and key to test data and sampler type.																	þ
	$\equiv$																			
	$\equiv$																			E
	=																			F
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194.57	90																			E
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0 2/2	$\exists$																			E
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189.57	95																			
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3	<b>=</b>																			Ē
PK	=																			Ė
5																				E
	$\exists$																			Ē
5	=																			Ė
184.57	100																			É
189.57 18																				
2								REPORT T		:CO	RD								IOLE ID 80014R	
1 1								DIST.		INTY	٠. ١	ROL	JTE	F	OSTN	/ILE		-	A	
	<b>(</b>	A	LIFORNIA LIRS HMM	ARUP			F	ROJECT	OR B	RIDG	E NA	ME								
			Speed Rail Authority	IGH-SPEED TI	RAN			Californ BRIDGE N	ia Hi	gh-S	Spe	ed T		Y			ПΔ	TF	SHEET	
		J	,					DOL IV	LIVIUL	-1 \		. Mag			rran		2-	TE 20-1	2 5 of 5	

Cal			h-Speed Train Fres														_   1	315	77-0	00
	GED BY Poling		BEGIN DATE Oct-18-11	COMPLETION DATE Oct-18-11	BORE N21	HOL 414	E LC 24.	DCA 139	TION (Late) / E633	:/Long 7011	or N .693	orth/ 3 (N	East a <b>latio</b> r	nd Da nal G	tum) rid)			00°,		₹
DRIL	LING CC		CTOR/DRILLER		IN-SIT												SI	JRFA	CE EI	LEVATION
	her/W				DDILL	DIC											_			(NAVD88) DIAMETER
	LING ME GER(0		) ), ROTARY(6.5'-51.5	5')	DRILL Faili			0										JREH 1.875		DIAMETER
		. ,	AND SIZE(S) (ID)		1				PE/HAMM										R EF	FICIENCY, ERI
	T(1-3/8		FILL AND COMPLETION						DURING			•	CTCC	ווחם ו	LINC	/DATE		38%	DED.	TH OF BORING
	at ceme				READ			EK	Not Re			) <i>F</i>		ot Rec		(DATE		51.5 f		I H OF BORING
(i)		phics				Location	nber	oth (ft)	ï.	ft)	(in)	(1	(%)	ntent (%)	(%)	(%) xəp		gth (tsf)	pot 1	5
Elevation (ft)	Depth (ft)	Material Graphics				Sample Loc	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Remarks/
Н.	0	≥		escription lish brown; dry; fine to me	edium		တ် 301	0 0	՝	Ż	60	60	7	Σ		<u> </u>	0	<u>N</u>	<del>B</del>	2" of asphalt
			SAND; some fines; weal		out.	20000000000000		5					34.5							Bulk sample taken in bucket
281.65	5 =		5.0', grades very dense:	decreasing fines content		) //s	502	5	1-19-30	49	18	18								
			, g,,,		-	JXI.							20.9	7						
			Poorly graded SAND (SI	P); dense; light reddish br	own;	$\mathbb{A}_{\epsilon}$		6.5	00 00 40	<b>54</b>	10		20.9						1	
	=		moist to dry; fine to med cementation; [ALLUVIUI	ium SAND; trace SILT; w vl].	eak	W.	503	6.5	33-32-19	51	18	9	16.7	14.3						Mud tub set at 6.5'
	]		Poorly graded SAND wit	h SILT (SP-SM); very der et; fine to medium SAND;	nse; few			8												
		$\prod \prod $	fines; trace to medium c		ICW	/\/s	604	8	8-12-15	27	18	17								
	=		SILTY SAND (SM); med	ium dense; brown; wet; fi		M		9.5					33.9	19.7						<u> </u>
276.65	10-		medium SAND; some fir SAND; weak cementation	nes; trace medium coarse n.	•	S	305	9.5	9-11-16	27	18	18								
270.00						X		11					31.6							
	=					/ ) 			20-21-23	44	18	16								
				; light brown with reddishes; some fine to medium S															$\sim$	
OI.			trace medium coarse SA	AND; weak cementation.	» « <b>« »</b>			12.5	15-14-16	30	18	15	56.9	19.9						
/20/1:	=			(CL-ML); hard; light brov	 vn;		007	12.5	13-14-10	30	10	15								1
LB 2	<u> </u>		wet; little SAND; weak or	ementation.		$\mathbb{H}$		14					72.5		24	4				<u> </u>
RY.G	=					Ms	808	14	10-18-24	42	18	12								
271.65	15					Н		15.5					75.7	21.7	23	5				1
JIRI																				
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3.GP.	_																			
CHSR_F-B.GPJ ARUP DOTR LIBRARY GLB 2220/12 127 1911 - 220/12	=																			
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HSH LSS:30			(continued	0																
O-0									REPORT T			ВL								HOLE ID S0015R
									DIST.		INTY			UTE	F	POSTN	/ILE		_	EA
0.3 BOREHOLE LOG - CHSTP	<b>a</b> (	Δ'	LIFORNIA	URS HMM	ARUP			P	ROJECT	OR P	RIDG	E N	AMF							
BORI		iah	Speed Rail Author	The second state	H-Spers T	- AND			Californ	ia Hi	igh-	Spe	ed T		.,			1		
1.0.3		igii <sup>2</sup>	opecu kuli Aulilor	JALE DE LE PEU				$\perp^{B}$	BRIDGE N	UMBE	:K 			RED B ggi/T		rran		DA 2-2	TE 20-1	SHEET 1 of 3

			h-Speed Train Fres BEGIN DATE	no to Bakersfie	ld F RODE	:H\	)  <u> </u>	OC v.	TION (La	t/Long	Or N	orth/	Fact o	nd Da	tum\		1	3157	77-00	)	
	Poling		Oct-18-11	Oct-18-11	N21	41	424	.139	) / E633	37011	.693	3 (N	Lasi a latior	nal G	rid)			300°			
	ING CC		ACTOR/DRILLER (er		IN-SIT	T U	ΓEST	ING												EVATION NAVD88)	
DRILL	ING ME	THO	D		DRILL												ВС	DREH	OLE [	DIAMETER	
	<u> </u>		), ROTARY(6.5'-51.5 ) AND SIZE(S) (ID)	')	Faili				PE/HAMN	IED ID	<b>.</b>						_	1.875		FICIENCY, ERI	
SPT	(1-3/8	")	, , , ,		Auto	om	atic	, 140	) lbs, 30	O-incl	n dro	•					(	88%			
	HOLE E		FILL AND COMPLETION rout		GROU READ			ΓER	DURING Not Re			; A		DRILI		(DATE		TAL 51.5 f		H OF BORING	
		, <u>9</u>																			Τ
Elevation (ft)	Depth (ft)	Material Graphics	De	escription		Sample Location		Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Remarks/ Other Tests	
<b>—</b>	<b>-</b> 20 =	2	SILTY SAND (SM); dens	e; light brown; fine to	medium	\/	S09	20	12-18-26	44	18	15	44.3	15.6		п.	0	o o	-	20.0', switch to 4"	+
264 65			SAND; some fines; weak Poorly graded SAND (SF trace SILT; fine to mediu coarse SAND; weak cerr	P); dense; light brown m SAND; trace medi	; wet; um	<u> </u>		21.5						10.0					<u>0000000000000000000000000000000000000</u>	DIT	
261.65	25		SILTY SAND (SM); dens brown mottling; wet; fine	e; light brown with re SAND; some fines; v	ddish veak	V	S10	25	11-15-16	31	18	18									E
			cementation. 26.0', grades to fine med	ium SAND.				26.5					30.8	22.1							
256.65	30 =		Poorly graded SAND with brown with reddish brown			M	S11	30	10-17-23	40	18	12	6.5	21.2							
251.65	35		medium SAND; few fines SILT (ML); hard; grayish trace medium SAND; we	brown; wet; few fine ak cementation.				31.5					85.5						$\sim$		
251.65			Poorly graded SAND with grayish brown with red in fines; weak cementation SANDY SILT (ML); hard some fine SAND; weak of	nottling; wet; fine SAN reddish brown; wet;	ND; few		S12	36.5	21-21-24	45	18	16	56.4	17.5					<u>0000000000000000000000000000000000000</u>		
246.65	<b>-</b> 40		(continued	)																	
240.03			UEOD\ '' \					E	REPORT S BORING DIST.	Ģ RE	ECO JNTY		RO	UTE	P	POSTN	ИILE		H S	OLE ID 50015R	
a Car		Ą	LIFORNIA	URS HM	MARUP				ROJECT Californ					rain							
	Н	ıgh-	Speed Rail Authori	CALFORM	IA HIGH-SPEED T	RAN		В	RIDGE N	IUMBI	R			RED B'		rran		DA <sup>2</sup>	TE 20-1	SHEET 2 of 3	

	ECT NA <b>forni</b> a		h-Speed Train Fresno to Bakersfield															T NUN <b>77-00</b>	
	ED BY		BEGIN DATE COMPLETION DATE Oct-18-11 Oct-18-11					TION (La 9 / E633								Н	OLE I		
DRILL	ING CC		ACTOR/DRILLER	IN-SIT				, , L000	7011	.030	۱۱) ک	valiUi	iai G	11u <i>)</i>		SI	JRFA	CE ELE	EVATION
	ner/W		<u>-                                      </u>	DDII I	DIC											_			NAVD88)
	ING ME SER(0		), ROTARY(6.5'-51.5')	DRILL Faili			00									- 1	экен 1.875		IAMETER
			) AND SIZE(S) (ID)	1				PE/HAMN								- 1		REFF	ICIENCY, ERI
	(1-3/8 HOLE I		FILL AND COMPLETION					0 lbs, 30			•	AFTER	R DRIL	LING	(DATE	- 1	S8%	DEPTH	OF BORING
	t cem			READ				Not Re					ot Rec		(=	1	1.5 f		
		s					<u></u>						t (%)		(%		tsf)		
(F)		Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	6 in.	(#	(ii)	n)	(%)	Moisture Content (%)	(%)	Plasticity Index (%)	<u> </u>	Shear Strength (tsf)	thod	
Elevation (ft)	(#)	al Gr			le Lo	le Nu	le De	Ser	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	lre C	Liquid Limit (%)	ity Ir	Organics (%)	Stre	Drilling Method Casing Depth	
Eleva	Depth (ft)	/ateri	Description		samp	samp	samp	Blows	-Vali	enet	Seco.	W 00	Aoistu	iquid	Plastic	Organ	Shear	Sasin	Remarks/ Other Tests
_	<b>-</b> 40		SILTY SAND (SM); dense; reddish brown; wet; fir	ne		S13		14-14-16		18	14	14			<u>"</u>		(0)		0.101 1000
	=		SAND; some SILT; weak cementation.		$\mathbb{N}$		41.5					49.8	17.5						
	Ξ																		
	45																		
	₫																		
	$\exists$																		
41.65	45		45.0', grades to very dense.		М	S14	45	16-32-35	67	18	16	1							
	=				M		46.5												
	₫																		
	∃																		
	=																		
	=																		
236.65	50		SILTY CLAY (CL-ML); hard; grayish brown with re brown mottling; wet; trace fine SAND; weak	eddish	M	S15	50	20-26-29	55	18	17	91.9	-	25	4			<u>0000000000000000000000000000000000000</u>	
	$\exists$		cementation.  Poorly graded SAND (SP); very dense; light reddi	J	$\mathbb{N}$		51.5												
	$\exists$		brown; wet; fine SAND; few SILT; weak cementat Borehole terminated at a depth of 51.5 on 10/18/	ion.	$\sqcap$						-							للحد	
			For corrosion test results, see Appendix E.																
			Soil moisture indicated as "wet" because SPT sar																
	=		became wet during retrieval through rotary metho drilling fluid. Soil moisture indication should not b	е															
31.65	55-		used as an indication of a potential phreatic surfa free groundwater table.	ce or															
	· =		See Borehole Log Legend for soil classification chand key to test data and sampler type.	nart															
	∃		and noy to test data and sampler type.																
	=																		
	$\exists$																		
	$\equiv$																		
226.65	60-																		
							I -											1	V = 15
								REPORT T		<u>C</u> O	<u>R</u> D								DLE ID 0015R
								DIST.		JNTY			UTE	F	POSTN	ΛΙLΕ		EA	
			LIFORNIA LURS HMM A	ARLIP			F	ROJECT	OR B	RIDO	Spe	AME	rain						
	H	igh-	Speed Rail Authority	H-SPEED TO	RAN			BRIDGE N			PF	REPAR	RED B				DA		SHEET
											D	). Ma	ıggi/T	. Cu	rran		2-2	<u> 20-12</u>	2   3 of 3

Cali LOGG N. G DRILL Greg DRILL ROT SAMP SPT BORE	ED BY coode NG CC gg/D. NG ME ARY( LER TY	A High NOW NOTRA MCM ETHOI 0'-16 (PE(S)		N21: IN-SITI DRILL Mob SPT H. Auto	RIG il B AMI oma	779. EST 6-80 MER atic,	.582 ING R TYF	TION (La 2 / E633 PE/HAMM ) lbs, 30 DURING Not Re	ER ID	n dro	) (N	lation	DRILL	rid)	`	11 H(C) S(C) S(C) S(C) S(C) S(C) S(C) S(C) S	1315 1315 1300 1315	16R CE ELE 2 ft (N OLE D n R EFF		
Elevation (ft)	o Depth (ft)	Material Graphics	Description			Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
283.82 278.82 278.82 278.82	5 10 15 15 15 15 15 16 17 17 17 17 17 17 17 17 17 17 17 17 17		ASHPHALT (5") (AC).  AGGREGATE BASE (5") (AB).  SANDY SILT (ML); brown; moist; subrounded; so fine SAND; trace GRAVEL; rapid dilatancy; [ALLUVIUM].  5.0', grades grayish brown; wet.  SILTY SAND (SM); dense; grayish brown; wet; medium; subrounded; some SILT; slow dilatancy; oxidation seams.		\$	S01 S02	5 5 5 10 11.5 16.5	12-15-16	31	18	18 16	62.5	11.8	19	3			<u> </u>		
268.82	-2U		(continued)				1-	TEDOST -										1,,,	N.E.ID	_
Tro.3 Boxerbore	Н	A igh-	LIFORNIA Speed Rail Authority	ARUP H-SPEED TR	IAN		D P	REPORT T BORING BIST. PROJECT Californ BRIDGE N	COL OR B	RIDG gh-S	Spe	AME ed T	UTE rain RED B ggi/T	Y	POSTN	/ILE	DA 2-:			

	ECT NA fornia		h-Speed Train Fre	eno to Bakersfi	eld														T NUM 77-00	MBER	
LOGG	ED BY	•	BEGIN DATE Oct-26-11	COMPLETION DA	TE BORE				TION (La 2 / E633								H	OLE 10	)		
DRILL	ING CC	NTR/	ACTOR/DRILLER acken	OCI-27-11	IN-SIT				7 2000	0000	1.21	1 (1)	ialioi	iai G	iiu)		SL	JRFAC	E ELE	VATION IAVD88)	
DRILL	ING ME	THO	)		DRILL												ВС	OREH	OLE DI	AMETER	
	LER TY		) AND SIZE(S) (ID)		Mot SPT H				PE/HAMIV	IER ID	)							3.25 i		CIENCY, ERI	
	(1-3/8		FILL AND COMPLETION						) lbs, 30			-		DDII	LING	(DATE		38%	DEDT	OF BODING	
	omete		-ILL AND COMPLETION		READ			IEK	DURING Not Re			, <i>P</i>		ot Rec		(DATE		60 ft		OF BORING	
Elevation (ft)	Depth (ft)	Material Graphics				Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	_	
Ele	Dep	Mate		Description									200	Mois	Liqu	Plas	Org	She	Orilli	Remarks/ Other Tests	
	20		20.0', grades very dens oxidation staining.	se; reddish brown; so	me SILT;	M	S05	20	28-36-23	59	18	16									
263.82	25							21.5					36.5	11.7					000000000000000000000000000000000000000		
263.82	25		Poorly graded SAND w dense; brownish gray; SILT; rapid dilatancy; r	wet; medium; subrou	edium — — — — — — — — — — — — — — — — — — —	X	S06	25 26.5	9-11-16	27	18	13	6.1						<u> </u>		
258.82	30		30.0', oxidation parting	s.			S07	30 31.5	8-11-9	20	18	12									
253.82								36.5					7.1	15.2					000000000000000000000000000000000000000		
	40		(continue	ed)																	
240.02									EPORT S		СО	RD								LE ID 0016R	
									IST.		INTY		RO	UTE	P	POSTN	/ILE		EA		
	H	A igh-	LIFORNIA Speed Rail Autho	3	MM ARUP	RAN			ROJECT Californ RIDGE N	ia Hi	gh-	Spe PF	ed T	RED B	Y	Irre -		DA	TE	SHEET	_
<u> </u>												$\perp \nu$	. ıvıa	ggi/T	. სu	<u>ırran</u>		2-2	20-12	2 of 9	

Cali LOGG N. C DRILL Gree DRILL ROT SAMP SPT BORE	ED BY GOODE ING CO ING ME ARY (1-3/8	MOW DNTRAMEMOETHOE O'-16 PE(S) BACKE		N21: IN-SIT DRILL Mob SPT H Auto	RIC il B AMI oma	FST S-80 MER atic,	.582 ING R TYF	TION (Lat 2 / E633 PE/HAMM ) Ibs, 30 DURING Not Re	ER ID	on dro	) (N	AFTER	DRILL ot Rec	rid)	(DATE	11 H(C) SI 22 B(C) (C) H/C (S) T(C) T(C)	13157 DLE 10 3001 JRFAC 288.8 DREHC 3.25 I AMME 38%	77-00 16R DE EL 2 ft ( OLE D n R EFF	
Elevation (ft)	Depth (ft)	Material Graphics	Description			Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Remarks/ Other Tests
243.82	45		SILTY SAND (SM); dense; reddish brown; wet; subrounded; medium little SILT; black mafic minerpartings.  SANDY SILTY CLAY (CL-ML); very stiff; grayish brown; wet; little SAND; low plasticity; high dry strength medium toughness.  CLAY with SAND (CL); very stiff; grayish brown; wet; little SAND; medium plasticity; high dry strength; medium toughness.	— — — ral — — — ength;	X	S10	40 41.5 45 46.5 50 51.5	6-7-12 16-15-19	34	18	15	14.4 17.9 37.6 73.3	15.3	30	14			000000000000000000000000000000000000	Black partings in the top 3" and the bottom 2" of S10 sample
233.82	555		SILTY SAND (SM); very dense; reddish brown; we fine to medium; some SILT.			S12	55 56.5	12-20-30	50	18	13	33.3	13.5					<u> </u>	
228.82	-0U		(continued)															-	
	Н	CA igh-	LIFORNIA Speed Rail Authority	ARUP H-SPEED TH	IAN		E D	REPORT 1 BORING DIST. PROJECT Californ BRIDGE N	COL OR B	RIDG	SE NA	AME ed T	RED B	Y	POSTM		DA <sup>-</sup> 2-2		

	ECT NA		h-Speed Train Free	sno to Bakersfield															T NUI 77-00		
LOGG	ED BY	•	BEGIN DATE Oct-26-11	COMPLETION DATE Oct-27-11					TION (La ? / E633								H	OLE ID		<u> </u>	
DRILL	ING CC	NTR/	ACTOR/DRILLER acken	OGI 21-11	IN-SIT				. / _000	5500		' (1)	·auol	iai O	. Iu <i>)</i>		SL	JRFAC	CE ELE	EVATION	_
DRILL	ING ME	THO	)		DRILL														•	NAVD88) IAMETER	
	CARY(		60') ) AND SIZE(S) (ID)		Mob SPT H				PE/HAMIV	ER ID	)							3.25 i		ICIENCY, ERI	
SPT	(1-3/8	5")			Auto	oma	atic,	140	) lbs, 30	)-incl	n dro	•					8	38%			
	omete		FILL AND COMPLETION		READ			ER	DURING Not Re			i A		DRILI		(DATE		60 ft		H OF BORING	
Elevation (ft)	S Depth (ft)	Material Graphics	C	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	8 N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
	$\exists$					M	S13	60	19-28-32	60	18	18	42.7	14.9							F
223.82	65			ith SILT (SP-SM); dense; dium; subrounded; few SIL	 .T;	<u> </u>	S14	65 66.5	12-14-16	30	18	11	9	15.5					000000000000000000000000000000000000000		
218.82	70			d; brownish gray to reddish SAND; weak cementation; /2 inch thick.			S15	70 71.5	14-29-69	98	18	18	52.7	20						Calcite and weak cementation layers at 70.5' - 70.55' 70.3' - 70.35', varies from no to moderate cementation	
213.82	75			grayish brown; little SAND sticity; slow dilatancy; no	;	X	S16	75 76.5	5-12-18	30	18	15	64.4	24.9	22	2			000000000000000000000000000000000000000		
	<b>-</b> 80 <b></b>		(continue	d)												_		_			
								E	EPORT T		СО	RD								DLE ID 0016R	
-200.02-		- A							IST.		JNTY			UTE	F	POSTN	/ILE		EA		
		A	LIFORNIA Speed Rail Author	URS HMM A	RUP				ROJECT Californ	ia Hi	gh-	Spe	ed T								
	Н	ıgn-	opeea Kali Aumoi	CALIFORNA HO	H-SPEED TH	HAIN		В	RIDGE N	UMBE	R	PF D	REPAR . Ma	RED B ggi/T	Y . Cu	ırran		DA <sup>2</sup>	TE 20-12	SHEET 4 of 9	

	ECT NA		h-Speed Train Fres	sno to Bakersfie	ld														T NUN <b>77-00</b>		
LOGG	ED BY	_	BEGIN DATE Oct-26-11	COMPLETION DAT	E BORI				TION (La 2 / E633								H	OLE IE			
DRILL	ING CO	NTR/	ACTOR/DRILLER	000 27 11	IN-SI				27 2000		,. <u>_</u> ,	. (	latioi	- Iui O			SL	JRFA(	CE ELE	VATION	_
	gg/D. Ing me		acken O		DRIL	L RIC	3													IAVD88) AMETER	
RO	ΓARY	0'-16	60')		Мо	bil E	3-80										6	3.25 i	n		
	LER T\ (1-3/8		AND SIZE(S) (ID)						PE/HAMIV D lbs, 30			р						AMME 38%	REFF	CIENCY, ERI	
BORE	HOLE I	SACKE	FILL AND COMPLETION		GRO REAL	UND	WAT S	ER	DURING			) A				(DATE	<i>'</i>   '			OF BORING	
Piez	omete	er			TALY	1			Not Re	corde	<u>.</u>		N	ot Rec	oraea		1	60 ft			Т
		hics				ion	Ser	(#) ر	۔		<u></u>			Moisture Content (%)	(%)	Plasticity Index (%)		Shear Strength (tsf)	٥		
Elevation (ft)	(F)	Material Graphics				Sample Location	Sample Number	Sample Depth (ft)	per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	e Con	Liquid Limit (%)	y Inde	Organics (%)	treng	Drilling Method Casing Depth		
evatic	Depth (ft)	ateria				ımple	ımple	ımple	Blows p	Value	netra	ecove	0 Wa	oisture	J pink	asticit	ganic	lear S	Drilling Casing I	Remarks/	
Ш	_80 <del></del>	Σ	D SILTY SAND (SM); den	escription se; grayish brown; we	t; some		ഗ് S17	80 80	9-15-26	2 41	18	18	20	Š	Ĕ	₫	ō	क	<del>/      </del>	Other Tests	+
	$\equiv$		SILT; weak cementation	1.		X		81.5					46.3	22							
						Н		01.0											000000000000000000000000000000000000000		
																					Ē
	=																				Ė
	=																				Ė
203.82	85																				
203.62	00		SAND with SILT (SP-SN few SILT.	M); dense; grayish bro	wn; wet;	M	S18	85	16-19-21	40	18	15							200		F
						А		86.5					10.3								
	=																		000		F
	=																				E
																					Ē
198.82	90 =		SILTY SAND (SM); very		 n; wet;	-	S19	90	21-30-40	70	18	18									Ė
	=		some SILT.			X		91.5					43.7	15.6							
	=					$\mathcal{A}$															
																			) () ()		Ē
	=																				
	=																				į
193.82	95																				
100.02			95.0', grades dense; littl	e SILT.		M	S20	95	12-20-25	45	18	18									
	Ξ					Δ		96.5					26.9	18.7							
	=																				F
	<u> </u>																				Į
	=																				F
																			000000000000000000000000000000000000000		Ī
188.82	100	1111	(continued	d)																	
			(	•					REPORT											LE ID	
									BORINO DIST.		ECO JNTY		RO	UTE	P	POSTN	/ILE		S( EA	0016R	_
(	<b>(</b>	Δ	LIFORNIA	URS HM	MARUP			P	PROJECT	ORE	RIDG	SE NA	AME								
	H	igh-	Speed Rail Author	CALIFORN	A HGH-SPEED	TRAN			Californ	ia H	igh-	Spe	ed T	rain RED B	Y			DA	TE	SHEET	
		5		•					DUL IV	. CIVIDI	_, `	Ď	. Ma	ggi/T	<u>'</u> . Cu	rran		2-2	20-12	5 of 9	

DRILLING Gregg DRILLIN ROTA SAMPLE SPT(1	ornia DBY oden GCO JD. M GME ARY(( ER TY) DLE B	High NTRA McMa THOE D'-16 PE(S) ACKE	)	N21 IN-SIT  DRILL  Mob  SPT H  Auto	RIG II B AMI Oma	FST S-80 MER atic,	.582 ING R TYF 140	TION (Lat 2 / E633 PE/HAMM ) lbs, 30 DURING Not Re	B686	n dro	) (N	lation	DRILLI	rid)	`	11 HG S SU 22 BG 6 H/4 8 E) TG	288.8 DREHI 288.8 DREHI 3.25 i AMME 38% DTAL I	16R CE ELE 2 ft (N OLE D n R EFF		
Elevation (ft)	O Depth (ft)	Material Graphics	Description			Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
			Poorly graded SAND (SP-SM); dense; brown; wet medium to coarse; subrounded; few SILT.	.,			100		43	18	18	12.4	19.7					000000000000000000000000000000000000000		
183.82 10	05		105.0', grades medium dense; grayish brown.		X		105 106.5	12-14-15	29	18	12	7.7						<u> </u>		
178.82 11			110.0', grades dense; brown.  SILTY SAND (SM); dense; brown; wet; fine; some SILT.				111.5		33	18	18	12.5	25.9					$\sim$		
			SANDY SILT (ML); hard; brown with gray seams; some fine SAND; slow dilatancy.	wet;			115 116.5	18-30-63	93	18	18	55.3	20.3					000000000000000000000000000000000000000		
2	.0		(continued)																	
108.82=12	Hi	[A	LIFORNIA Speed Rail Authority	H-SPEED TH	AN		E C	REPORT 1 BORING DIST. PROJECT Californ BRIDGE N	COL OR B ia Hi	RIDG gh-S	Spe	AME ed T	UTE rain RED B ggi/T	Y	POSTN		DA:			

Ca	JECT N liforn	ia Hio	h-Speed Train Fre	sno to Bakersfield															T NUI 77-00		
LOG	GED B'	Y	BEGIN DATE Oct-26-11	COMPLETION DATE Oct-27-11					TION (La 2 / E633									OLE 10	16R		
			ACTOR/DRILLER acken		IN-SIT												SI	URFA	CE ELE	EVATION	_
DRIL	LING N	IETHOI	)		DRILL												_		•	NAVD88) IAMETER	
		(0'-16	60') ) AND SIZE(S) (ID)		Mok				PE/HAMM	IED IF								6.25 i		ICIENCY, ERI	
SP	T(1-3	("8"			Auto	om	atic	, 140	0 lbs, 30	O-incl	n dro						8	88%			
	EHOLE <b>zome</b>		FILL AND COMPLETION		GROU READ			TER	DURING Not Re			6 A		DRIL ot Rec		(DATE		OTAL 160 ft		OF BORING	
														(%)		(i)					Τ
<u> </u>		phics				ation	nber	oth (ft)	.⊑ਂ	æ	(ii)	<u></u>	(%	ntent	(%)	(%) xəp		gth (t	و ج		
Elevation (ft)	(#)	al Gra				e Loc	e Nur	е Dер	per 6	/lq) ər	ation	ery (ir	ash (	S e	Limit	ity Inc	ics (%	Stren	) Meth		
Eleva	Depth (ft)	Material Graphics	Г	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
	120			brown; wet; few SAND; m	edium	\\/	S25			59	18	18	- (4		_			0,		0 4.101 1 00.00	ŧ
	-		plasticity, slow dilatario	у.		X		121.5					88	32.7	38	15			000000000000000000000000000000000000000		
	-																				E
																			1000		E
	-																				
	-																				Ė
163.82	125		SANDY SII T (MI ): har	rd; light olive brown; wet; s		_	526	125	11-14-18	32	18	12									
				um SAND; slow dilatancy.	one	X				32	10	12	51.6	25.3					1000		E
	=							126.5													
	-																				F
																			1000		F
																					E
																			000		Ė
158.82	130-		SILTY SAND (SM); der medium: some SILT.	nse; light grayish brown; fi	ne to	$\overline{}$	S27	130	15-15-24	39	18	18									E
	-		Laminated from 131.0 t	to 131.6 feet.		$\bigwedge$		131.5					40.6						1000		Ė
	_																				E
	-																		2000		Ī
	-																				Ė
153.82	135		Poorly graded SAND w				S28	135	12-13-17	30	18	16							000		Ė
			brownish gray; fine SAI	ND; few fines.	iigi ii	X	020					10	12.4	33.5							Ė
						$\vdash$		136.5											200		E
	=																		3000000000000000000000000000000000000		F
	-																				
1	_																				E
ı																					E
	z <b>=</b> 140 <b>=</b>		(continue	ed)																	
									REPORT '		:C0	RD								OLE ID 0016R	
í									DIST.		JNTY		RO	UTE	F	POST	/ILE		ΕA		
			LIFORNIA	URS HMM	ARUP				ROJECT					rain							_
V		High-	Speed Rail Author	rity CALFORNA H	GH-SPEED T	RAN			BRIDGE N			PF	REPA	RED B				DA	TE	SHEET	
<u> </u>	High-Speed Rail Authority											_   D	. Ma	ggi/T	. Cu	ırran		2-	20-12	2 7 of 9	

PROJECT NAME  California High-Speed Train Fresno to Bakersfiel  A project NAME	d													T NUM <b>77-00</b>	IBER	
LOGGED BY BEGIN DATE COMPLETION DATE N. Goodenow Oct-26-11 Oct-27-11	BOREH			ATION (La 2 / E633								H	OLE ID	)		
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken	IN-SITU				0000	1.211	(1)	iation	iai G	iiu)		SL	JRFAC	E ELE	VATION IAVD88)	
DRILLING METHOD ROTARY(0'-160')	DRILL Mobi		2 <b>0</b>												AMETER	
SAMPLER TYPE(S) AND SIZE(S) (ID)				PE/HAMN	IER ID	)							3.25 ii AMME		CIENCY, ERI	
SPT(1-3/8")				0 lbs, 30			-				·		38%	.=	05 00000	
BOREHOLE BACKFILL AND COMPLETION Piezometer	READI		ATER	DURING Not Re			А			LING orded	(DATE		60 ft	DEPTH	OF BORING	
Plezometer    (a)   (b)   (c)   (d)   (d)	seams.  Int grayish not grayish not grayish ont grayish ont grayish ont grayish own to	Sample Location	29 140 141.8 30 145 146.8	.c. .c. .c. .c. .c. .c. .c. .c.	% N-Value (bl/ft)	81 Penetration (in)	14 Recovery (in)	%) (%) 9.7	Moistrue Content (%) 32.7	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	(tst)	00000000000000000000000000000000000000	Remarks/ Other Tests	
dilatancy; few reddish brown oxidation seams.	pid		151.4	5				20.2	30.8							
(continued)  CALIFORNIA  High-Speed Rail Authority																
				REPORT BORING		CO	RD								LE ID 0016R	
			1	DIST.	COL	INTY		ROL	JTE	F	POSTN	ΛILE		EA		
CALIFORNIA JURINA	ARUP		F	PROJECT Californ	OR B	RIDG	E N/	AME ed T	rain					-		
High-Speed Rail Authority	A HGH-SPEED TRA	AN		BRIDGE N			PF	REPAR	RED B	Y			DA	ΓE	SHEET	
							D	. Ма	ggi/T	. Cu	ırran		2-2	20-12	8 of 9	

Cali	ifornia		h-Spe	ed Tr	ain F	resn	o to	Bake	ersfie	ld														77-00	BEK	
	ED BY	now		EGIN D Oct-26				LETIO 27-11	n dat 1					TION (I 2 / E63									OLE II	16R		
DRILL	ING CC	NTRA	CTOR/I					-			I-SITU						<b>(</b> -			.,		SL	JRFA	CE ELE	VATION	
	gg/D. ING ME									D	RILL R	lG										_			AVD88)	
RO	ΓARY(	0'-16	0')							1	Mobil	B-8										6	3.25	in		
	LER TY (1-3/8		AND SI	ZE(S) (	(ID)									PE/HAN D lbs,			эр						AMME 38%	ER EFFI	CIENCY, E	.Ri
BORE	HOLE E	ACKF	ILL AND	COM	PLETIC	NC					ROUN EADIN		TER	DURII			) A				(DATE	′ I			OF BORIN	1G
Piez	omete	er .								10	LADIN	00		Not I	Recorde	ea		N	ot Red	oraea		1	60 f	t		
		hics									9	e e	(ft)	_		<u></u>		_	Moisture Content (%)	()	(%) ×		Shear Strength (tsf)	ъ		
n (ft)	æ	Material Graphics									-	Sample Location Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Con	Liquid Limit (%)	Plasticity Index (%)	(%) s	trengl	Drilling Method Casing Depth		
Elevation (ft)	Depth (ft)	ıterial									9	mple	mple	d swa	/alue	netra	cover	o Was	isture	nid L	sticit	Organics (%)	ear S	lling I sing I	Remark	(s/
	160	Ma				Desc	criptio	n			Č	Sa G	Sa	Blc	Ź	Pe	Re	20(	ΜO	Lig	P	Ö	Š	Ca	Other Te	
123.82	165		10/27/ The so logging perform grouting For consoli mused as free group See Both See	reen is y was p med to g insper rrosion pisture e wet of fluid. S an incoundward was a prosider out	Piezon locate perform the sai ector.  test re indicat during i Soil mo dicatio ater tal	neter wed from hed for tisfaction esults, seed as retrievable on of a pole.	vas insolvas	stalled to 15 orehol- the Cit oppendi- because ugh ro- stion sl tial phr	down to the control of the control o	outing weesno  sample ethod	as es or															
18.82	170																									
13.82	175																									
108.82	180																									
<u> </u>	<b>a</b> (	CAI	JFC	OR1	<b>VI</b> /	λ			RS   HM	M ARL	P		D P	REPORT BORIN	CT OR I	ECO UNTY BRIDG	SE N	AME	UTE	F	POSTM	1ILE			LE ID 0016R	
			peed				,	7	CALFORM	NA HGH-SP	EED TRAI	N		Califor BRIDGE			PF	REPAR	RED B				DA	TE	SHEET	
			•														D	. Ma	ggi/	Г. Сu	rran		2-	20-12	9 of	9

Cali	ifornia		h-Speed Train Fresno to Bakersfield	BODE	101.5	1004	TION! //	1/1					1		_ 1	13157	77-00	MBER )	
A. P	ED BY Poling		BEGIN DATE COMPLETION DATE Oct-25-11 Oct-27-11				TION (La 1 / E634								3	OLE 10	17R		
	ING CO		ACTOR/DRILLER wart	IN-SIT Stan			zometei	r										EVATION NAVD88)	
	ING ME		), ROTARY(6.5'-151.5')	DRILL Faili	RIG										В	OREH	OLE C	DIAMETER	
			), ROTART (0.5-151.5 ) ) AND SIZE(S) (ID)				PE/HAMN	/IER ID	)						_	4.875 AMME		FICIENCY, ERI	
	(1-3/8		FILL AND COMPLETION				0 lbs, 30			•	FTER	DDII	LING	(DATE		68%	DEDT	H OF BORING	
	omete		ILL AND COMI LETION	READI		AILK	Not Re			, ,		ot Rec		(DATE	′ I	151.5		TO BOILING	_
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
	0 =		ASPHALT (4") (AC). SILTY SAND (SM); brown; dry; fine to medium;		S0				60	60							<i></i>	Hand auger to 5.0'	ŧ
285.54	5		SILTY SAND (SNI), stown; dry, fine to medium, subangular; some SILT; trace GRAVEL; weak cementation; [FILL].  SANDY SILT (ML); very stiff; grayish brown; mois dry, some fine SAND; weak cementation; [ALLU].	st to /IUM].	<u>                                      </u>	5 2 5	5-8-8	16	18	12	43.3							Modified Proctor: Max $\gamma_d$ = 125.4 pcf Optimum W <sub>i</sub> = 7.6%	
	10				<i>V</i> \	6.5					64.7							Set mud tub at 6.5'; 4.875" drag bit	
280.54 275.54			10' Grades hard; grayish brown to brown; wet; so fine-medium SAND; weak to moderate cementati		S0	11.5		50/ 3"	3	1								10.0', driller notes hard material	
-270 54			SILT with SAND (ML); hard; grayish brown; wet; SAND; trace medium to coarse SAND; low plastic weak cementation.  Poorly graded SAND (SP); dense; grayish brown fine to medium; trace fines; weak cementation.	city;	So	16.5		32	18	15	74.3						000000000000000000000000000000000000000	15.0°, wood debris in cuttings	
<b>-</b> 270.54	-20		(continued)																
270.34	<b>&gt;</b> (	۸-	IIEODNIIA   urs hmm	ARLIP		1	REPORT BORING DIST.	G RE	JNTY			UTE	F	POSTN	ИILE			OLE ID 0017R A	
			LIFORNIA Speed Rail Authority	SH-SPEED TO	AN	(	PROJECT	nia H	igh-	Spe	ed T					5.		O. IEEE	
	"	·9···	opeca kan Aumorny				BRIDGE N	NOMB	-K		REPAF			rran		DA 2-2	1E 20-1:	SHEET 2 1 of 8	

	ECT NA		h-Speed Train Fresi	no to Bakersfield													- 1		T NUM 7 <b>7-00</b>	IBER	
LOGG	ED BY	<u>g</u>	BEGIN DATE Oct-25-11	COMPLETION DATE Oct-27-11					TION (La								HC	OLE ID	)		
DRILL	ING CC		ACTOR/DRILLER	00027 11	IN-SIT	U T	EST	ING				- (1,	iatioi	iai O	iiu)		SL	JRFAC	E ELE	VATION	_
DRILL	her/W ING ME	THOE	)		DRILL		-	piez	zometer										•	IAVD88) AMETER	
			), ROTARY(6.5'-151.5 AND SIZE(S) (ID)	5')	Faili				PE/HAMN	בם ום								.875		CIENCY, ERI	
SPT	Γ(1-3/8	3")			Auto	oma	atic,	140	) lbs, 30	)-incl	n dro	•					6	88%	KEFFI	CIENCY, ERI	
	HOLE I		FILL AND COMPLETION		GROU READ			ΓER	DURING Not Re			) A		DRIL ot Rec		(DATE		51.5		OF BORING	
					-																$\top$
		Material Graphics				ation	per	th (ft)	. <u>⊑</u>	æ	(in)	(	(%)	Moisture Content (%)	(%)	Plasticity Index (%)		Strength (tsf)	ا م		
ion (ft	(ft)	al Gra				e Loca	e Nun	е Dep	per 6 in.	e (bl/1	ation	ery (in	ash (9	o S	Limit	ity Inc	%) sɔ	Stren	Meth		
Elevation (ft)	Depth (ft)	Nateria	De	escription		Sample Location	Sample Number	Sample Depth (ft)	Blows	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	/oistu	Liquid Limit (%)	lastic	Organics (%)	Shear (	Drilling Method Casing Depth	Remarks/ Other Tests	
	20 =		SILTY CLAY with SAND	(CL-ML); hard; grayish l	brown;		S05	20	ш 12-22-37	59	18	14	7			п.	U	O)	_	Other rests	+
	=		wet; little medium to coar	'se Sand; weak cemen	ation.	Δ		21.5					72.1		21	4					
	<u> </u>																				
																					E
265.54	25		Poorly graded SAND with		- — — – n	-	S06	25	10-13-16	29	18	12									
			dense; grayish brown; we weak cementation.			$\mathbb{A}$							13.5						<u> </u>		
								26.5													
																					Ħ
260.54	_																				
260.54	30-		30' Grades to medium SA	AND.		M	S07	30	12-10-15	25	18	16									
						Δ		31.5					7.7								
7																					
777																					
5.5																					E
255.54	35-		35' Grades brown; fine-m	nedium SAND.		M	S08	35	38-18-8	26	18	8									
Z Z						$\cap$		36.5													
								00.0													
2																					E
CHOSK, T-B.GFU ANGP DO IN LIBRARY.GEB ZIZOTZ  222  24  24																					
XX.	=																				E
250 54	40_=																				
2			(continued)	)																	
3									REPORT S		CO	RD							HO S(	LE ID 0 <b>017R</b>	
			UEOD\ '' 1						IST.	COL	JNTY		RO	UTE	F	POSTN	/ILE		EA		
		A	LIFORNIA	URS HMM	ARUP			F	ROJECT Californ	OR B ia Hi	RIDG gh-S	SE NA	AME ed T	rain	,				•		
0.5.U.S	Н	igh-	Speed Rail Authori	Y CALFORNA H	GH-SPEED T	RAN			RIDGE N			PF	REPAR	RED B	Y Cu	ırran		DA <sup>-</sup> 2-2	TE 20-12	SHEET 2 of 8	
													. ivid	<u> </u>	. 50	a.ı			12		

	ECT NA fornia		h-Speed Train Fresno to Bakersfield													- 1		77-00		
LOGG A. P	ED BY	ıng	BEGIN DATE COMPLETION DATE Oct-25-11 Oct-27-11					TION (La								Н	OLE II	)		
DRILL	NG CC		CTOR/DRILLER	IN-SIT				r / ⊑034	.0030	002	- (11	•auUl	iai G	iiu)		_		17R CE ELE	EVATION	_
	ner/W			Star			piez	zometer	•									•	NAVD88) AMETER	
			, ), ROTARY(6.5'-151.5')	Faili			00										JREN 1.875		AIVIETER	
	LER TY (1-3/8		AND SIZE(S) (ID)	1				PE/HAMM D lbs, 30			าท					- 1	AMME 38%	REFF	ICIENCY, ERI	
BORE	HOLE E	BACKE	FILL AND COMPLETION	GROL	JND	)WA		DURING				FTER	DRIL	LING	(DATE			DEPTH	OF BORING	
Piez	omete	er		READ	ING	SS		Not Re	corde	1		N	ot Rec	orded	I	_   1	51.5	ft		$\overline{}$
		<u>S</u>			nc	<u>-</u>	(ft)						Moisture Content (%)		(%)		(tst)			
(#)		Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	(bl/ft)	Penetration (in)	(in)	200 Wash (%)	Conte	Liquid Limit (%)	Plasticity Index	(%)	Shear Strength (tsf)	Drilling Method Casing Depth		
Elevation (ft)	Depth (ft)	erial			nple L	nple	nple [	ws be	N-Value (bl/ft)	etrati	Recovery (in)	Was	sture	ja Lir	sticity	Organics (%)	ar St	Drilling M Casing D	Remarks/	
Ele	0-40	Mat	Description	-					>   Z   30			200	Moi	Lig	Pag	Org	She	-	Other Tests	
	∃		SANDY SILT (ML); hard; grayish brown; wet; son SAND; low plasticity; weak cementation.	ne fine	X	S09	40	9-12-18	30	18	8	62.4		22	3			000000000000000000000000000000000000000		E
	$\exists$						41.5													Ē
																		200		
	Ξ																			Ė
	=																			E
	Ξ																			Ē
245.54	45		SILTY SAND (SM); dense; reddish brown; wet; fii	 ne to	$\forall$	S10	45	18-18-23	41	18	12									Ė
	$\equiv$		medium; some SILT; trace coarse SAND; weak cementation.		$\Lambda$		46.5					31.6								
	∃						10.0													
	=																			
																				Ė
	∄																			Ė
	_ =																			E
240.54	50		50' Grades very dense; grayish brown with reddis brown mottling; fine.	sh	X	S11	50	50	50/ 6"	6	6	46.2								Ē
	=		<b>3</b> ,				51.5													
	₫																			E
	∃																			
	=																	200		Ē
	=																			F
235.54	55—					0.40		07.07.07		10	•									E
	$\exists$		55' Grades to reddish brown; fine to medium; little SILT.	9	X	S12	55	27-27-27	54	18	8	22.3								
	$\exists$						56.5													Ē
	∃																			F
235.54	∄																			
	$\exists$																			
230 54	=																	1000000000000000000000000000000000000		E
-230.54	-60-	1144	(continued)																	
			(conunucu)					REPORT											LE ID	_
-230.04							E	BORING	G RE	CO		RO	UTE		POSTN	/III F			0017R	
	> (	<b>^ ^ !</b>		ARLIP									J.L		5511					
		.A\	LIFORNIA Speed Rail Authority				(	PROJECT Californ	ia H	gh-	Spe	ed T								
	Н	ign-	opeed Kall Authority	H-SPEED TI	KAN		B	RIDGE N	IUMBE	₽R	PF D	REPAR . Ma	RED B ggi/1	Υ Γ. <b>C</b> u	ırran		DA 2-	TE 20-12	SHEET 3 of 8	

Cali LOGG A. P DRILL Pitcl DRILL AUC SAMP SPT BORE Piez	ED BY coling ING CO her/W ING ME GER(0 LER TO (1-3/8 HOLE I	ONTRA Ster THOE '-6.5' 'PE(S) BACKF		N21: Stan DRILL Failii SPT H Auto	361 UTI Idp RIG IND IND NG	102. EST ipe 150 MER atic, WAT	A64 ING piez 00 R TYF 140	TION (Lat / E634 zometer PE/HAMM ) Ibs, 30 DURING Not Rec	ER ID D-inch	n dro	ppp A	AFTER N	nal G	LING orded	(%)	1 HG SI 2 BG 2 H/ G SI 1 T G S	13157 DLE II 300° JRFA 290.5 DREH 1.875 AMME 68%	17R CE ELE 4 ft (I OLE D in R EFF		
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	oisture C	Liquid Limit (%)	Plasticity Index	Organics (%)	near Stre	Drilling Method Casing Depth	Remarks/ Other Tests	
220.54 S20.54 S2	65		60' Grades dense; some fines.  65' Grades very dense; grayish brown; fine to med SANDY SILT (ML); hard; grayish brown; wet; som SAND; weak cementation.  SILTY SAND (SM); very dense; reddish brown; we fine to medium; some SILT; weak cementation. 75.8' Grades to grayish brown with seams of redd brown 1/16" to 1/8" long and variegated white.	e fine	X	S13 S14 S15	60 61.5 65 66.5	25-31-41 17-22-22 30-31-50	72 44 44 81/ 11"	18 18 17	10 17	61.7						1000000000000000000000000000000000000		
n - 210 54	-80																			
20.3 BOREHOLE LOG - CHSIP	Э	CA igh-	(continued)  LIFORNIA  Speed Rail Authority	RUP	IAN		P	REPORT TO BORING PROJECT Californ BRIDGE N	COL OR B ia Hi	RIDG gh-	SE NA	AME ed T	RED B	Y	POSTN		DA 2-:	S EA	SHEET	_

Cali LOGG A. P DRILL Pitcl DRILL AUC SAMP SPT BORE	ED BY oling ING CO ner/W ING ME SER(0 LER TY	ONTRA Ster THOE '-6.5' 'PE(S) BACKF		N21 IN-SIT Stan DRILL Faili SPT H Auto	36° U T Idp RIC ng AM PMG ND	102. EST ipe 150 MER atic, WAT	1464 ING piez 100 R TYF 140 ER	TION (Later of February 1997)  TOTAL COMPANY OF THE PERMANNO I lbs, 30 DURING Not Re	ER ID 0-inch	n dro	pp A	Iatior FTER N	DRIL ot Rec	LING orded	(%)	SI S	13157 OLE II SOO URFAG 290.5 OREH 1.875 AMME 68% OTAL	17R DE ELE 4 ft (N OLE D in R EFF		
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	
205.54	85		LEAN CLAY (CL); hard; grayish brown; wet; few fimedium SAND; low plasticity; weak cementation.  SANDY SILT (ML); hard; grayish brown; wet; som to medium SAND; weak cementation.  80.9', grades to little fine to medium SAND.  SILTY SAND (SM); dense; grayish brown; wet; firmedium; little SILT; weak cementation.  SANDY SILT (ML); hard; brown; wet; some fine to mediumd SAND; weak cementation.	e fine		S18	80 81.5 85 86.5	9-12-19	45	18	15	85.1 56 17.7 51.7		27	4			000000000000000000000000000000000000000		
200.54	90		SILTY SAND (SM); very dense; reddish brown; w fine to coarse; some SILT; weak cementation.		X	S19	90 91.5	37-50	50/ 5.5"	12	12	36.2								
195.54	95		SANDY CLAY (CL); hard; grayish brown with redo brown layers; wet; some fine to coarse SAND; me plasticity; weak cementation.	dish dium	X	S20	95 96.5	34-50	50/3"	9	9	59.3						000000000000000000000000000000000000000		
190.54	100		(continued)																	
190.34	Н	A igh-	LIFORNIA Speed Rail Authority	ARUP H-SPEED TH	IAN		D P	EPORT 1 BORING IIST. ROJECT Californ RIDGE N	COL OR B ia Hi	RIDG gh-S	Spe	AME	RED B	Y	POSTN		DA:	S EA	SHEET	

A Poling						TION (Lat								H	1 <b>315</b> OLE II	<b>77-00</b>	MBER )
DRILLING   S.5   ROTARY (S.5* 151.5)   Same larry region   Same	DRILLING CONTRACTOR/DRILLER	IN-SITU	U TI	EST	ING			.302	<u> </u>	valiOľ	ial G	iiu)		SI	JRFA	CE ELE	
Automatic, 140   Ibs., 30-inch drops   BORHOLE BACKFILL AND COMPLETION   FIRE DEPTH OF BORNO   FIRE DEPTH OF	DRILLING METHOD	DRILL	RIG	}										В	OREH	OLE D	
Section   CLAYEY SAND (SC); very dense; grayish brown; wet;   Section   Se	SPT(1-3/8") BOREHOLE BACKFILL AND COMPLETION	Auto	ma ND\	atic, WAT	140	DURING	-inch	n dro LING	-				(DATE	) T(	38% OTAL	DEPTH	
185.54   105	Elevation (ft) Material Graphics  Material Graphics		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
SILTY SAND (SM); dense; brown; wet; fine to medium;   S24 115 12:24:25 49 18 16   26.4	CLAYEY SAND (SC); very dense; grayish brown; grayish brown; grayish brown;	wet;	X	S21	100 101.5	38-50	50/6"		11								
SILTY SAND (SM); dense; brown; wet; fine to medium;   S24 115 12:24:25 49 18 16   26.4	SANDY SIL1 (ML); hard; grayish brown with reddisbrown mottling; wet; fine to coarse; weak cementar					17-23-27	50	18	17	58.3						<u>100000000000000000000000</u>	
(continued)  REPORT TITLE BORING RECORD DIST. COUNTY ROUTE POSTMILE EA  PROJECT OR BRIDGE NAME California High-Speed Train	Poorly graded SAND (SP); dense; brown; wet; med trace fines; weak cementation.		X	,	111.5		34	18	17							$\sim$	
(continued)  REPORT TITLE BORING RECORD DIST. COUNTY ROUTE POSTMILE EA  PROJECT OR BRIDGE NAME California High-Speed Train	SILTY SAND (SM); dense; brown; wet; fine to med little SILT; weak cementation.  116' Grades fine.	dium;					49	18	16	26.4							
REPORT TITLE BORING RECORD DIST. COUNTY ROUTE POSTMILE  EA  PROJECT OR BRIDGE NAME California High-Speed Train BRIDGE NUMBER PREPARED BY D. Maggi/T. Curran 2-20-12 6 of 8																	
CALIFORNIA High-Speed Rail Authority  PROJECT OR BRIDGE NAME California High-Speed Train  BRIDGE NUMBER PREPARED BY D. Maggi/T. Curran 2-20-12 6 of 8	O CALIFORNIIA				E	BORING	RE			RO	UTE	F	POSTN	ИILE		S	0017R
	CALIFORNIA High-Speed Rail Authority	RUP H-SPEED TR	AN			Californ	ia Hi	gh-S	Spe PF	ed T	RED B		ırran		DA 2-	TE 20-13	SHEET 2 6 of 8

Cali	forn	IAME ia Hig	h-Speed Train Fr	esno to Bak	cersfield	00000			TION (1								_   1	1315	77-00		_
LOGG A. P	oling	3	BEGIN DATE Oct-25-11	COMPLETION Oct-27-1	11	N2136	102	.464									3		17R		
		ONTRA V. Ste	ACTOR/DRILLER wart			N-SITU T Standp			ometei	r										VATION NAVD88)	
DRILLI	ING N	/ETHO	)		Г	ORILL RI	<del>.</del> G		-01110101	-									•	AMETER	_
			), ROTARY(6.5'-15 ) AND SIZE(S) (ID)	51.5') ———		Failing SPT HAM				/ED IF	`							4.875		ICIENCY, ERI	_
SPT	(1-3	/8")				Autom						ор						68%		ICIENCT, ERI	
BOREI Piez			FILL AND COMPLETIO	N		GROUND		TER	DURING Not Re			3 <i>A</i>		DRIL ot Rec		(DATE		OTAL 151.5		OF BORING	
1 102	.01110				-				NOTING	Coraci					oraca	_					-
Elevation (ft)	Depth (ft)	Material Graphics		Description		Sample Location		Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests	8
			CLAY with SAND (CL SAND; trace medium cementation.	); hard; brown; v SAND; medium	wet; few fine n plasticity; wea	ak X	S25	121.5	17-50	50/6"	12	12	76.4		27	10					
165.54			Poorly graded SAND medium; trace fines; 125.4' Grades to gray	weak cementation		to V	S26	125	16-22-23	45	18	10									
160.54	130		130' Grades medium.			X		130 131.5	20-20-27	47	18	9									
155.54	135		135' Grades very den 135.5' Grades to med				S28	135 136.5	25-30-38	68	18	9	_								
150.54	140		(continu	ued)									<u> </u>			<u> </u>			$\simeq$		-
			·	-				E	EPORT BORING	G RE			DO.	UTE	-	POSTN	AII E			DLE ID 0017R	-
		CA	LIFORNIA	. 1	URS HMM ARI	UP		P	ROJECT	OR E	RIDG	SE N. Spe	AME ed T	rain		-0511	VIILE				_
		High-	Speed Rail Autho	ority	CALFORNIA HOH-S	SPEED TRAN		В	RIDGE N	NUMBI	ĒR		REPAR			ırrən		DA	TE 20-12	SHEET 7 of 8	2

PROJE Calif			h-Speed Train Fresno to Bakersfield															T NUN <b>77-00</b>		
LOGGE A. Po	D BY		BEGIN DATE COMPLETION DATE Oct-25-11 Oct-27-11					TION (La 1 / E634									SOO.	17R		
DRILLIN	NG CO		CTOR/DRILLER	IN-SIT	U T	EST	ING				٠,			/		SI	JRFA	CE ELE	EVATION	
Pitch DRILLIN				Star		•	piez	zometer	-							_		•	NAVD88) AMETER	
AUG	ER(0	-6.5')	), ROTARY(6.5'-151.5')	Faili	ng	150										4	1.875	in		
SAMPL SPT(			AND SIZE(S) (ID)	1				PE/HAMM 0 lbs, 30			р					- 1	4MME 38%	REFF	ICIENCY, ERI	
BOREH	OLE E	ACKF	FILL AND COMPLETION		JND	WA <sup>-</sup>		DURING	B DRIL	LING	-	FTER			(DATE	) TO	OTAL		OF BORING	_
Piezo	omete	r		READ	ING	5		Not Re	cordeo	t 		N <sub>1</sub>		corded		1	51.5	ft 		_
		Sics			on	er	Œ			=			Moisture Content (%)	<u> </u>	(%) ×		Shear Strength (tsf)			
n (ft)	æ	Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	er 6 in.	(bl/ft)	Penetration (in)	/ (in)	200 Wash (%)	Cont	Liquid Limit (%)	Plasticity Index (%)	(%)	rengt	Drilling Method Casing Depth		
Elevation (ft)	Depth (ft)	terial			nple l	nple !	nple [	Blows per	N-Value (bl/ft)	netrati	Recovery (in)	) Was	sture	lid Li	sticity	Organics (%)	ar St	Drilling Metho Casing Depth	Remarks/	
<u> </u>	0 140	Mad	Description (MI)	1.	Sar							200	Moi	Lig.	Pa	Org	She		Other Tests	
	3	Щ	SILT with SAND (ML); hard; brown; wet; little fine medium SAND; medium plasticity; weak cementa	tion.	╢	S29			33	18	18	70.9		40	14					
	=		Poorly graded SAND (SP); dense; brown; wet; fin medium; trace fines; weak cementation.	e to	Δ		141.5	5												1
	=																			
	3																			
	3																			
	=		Poorly graded SAND with SILT (SP-SM); dense; I	brown;	-													<u>0000000000000000000000000000000000000</u>		
15.54 1	_		wet; fine to medium; few SILT; weak cementation 144.5', grades to coarse.	ı. ^	orange	S30	145	14-18-23	41	18	12									
			SILT with SAND (ML); hard; brown; wet; few fine medium SAND; weak cementation.	to	$\mathbb{A}$		146.5					73.3								
	$\equiv$						140.0	1												
	=																			
	₫																			
	_																			
40.54 1	150		SANDY SILT (ML); hard; grayish brown with brown mottling; wet; some fine SAND; weak cementation		M	S31	150	13-27-25	52	18	18									
	=				$\mathbb{N}$		151.5	5				58.9								
	₫		Borehole terminated at a depth of 151.5' on					•										- N		_
	$\exists$		10/27/2011.																	
	$\exists$		For corrosion test results, see Appendix E.  Soil moisture indicated as "wet" because SPT sar	mnlee																
	$\equiv$		became wet during retrieval through rotary metho drilling fluid. Soil moisture indication should not b	od <sup>.</sup>																
35.54 1	155		used as an indication of a potential phreatic surfa free groundwater table.																	
			See Borehole Log Legend for soil classification of	nart																
			and key to test data and sampler type.																	
	$\exists$																			
	₫																			
	₫																			
	$\exists$																			
30.54 <del>-</del> 1	160																			_
								REPORT											LE ID	_
								BORINO DIST.		CO JNTY		RO	UTE	F	POSTN	/ILE		SI EA	0017R	
	<b>A</b> C	١Δ.	LIFORNIA LIRS HMM	ARUP				PROJECT												
			Speed Rail Authority	H- SPEED TO	RAN		(	Californ	ia Hi	gh-	Spe	ed T		·V			D.4:		CULT	_
	- 11	a., ,	cross Rull Admidity					BRIDGE N	IOIVIBE	-K		керан . Ма			rran		DA:	1E 20-12	SHEET 8 of 8	

Calif	CT NAME	igh-Speed Tr	rain Fre	esno to I	Bakersfield												_   1	1315	77-00	MBER )
OGGE A. Po	oling	BEGIN I Oct-2	7-11	COMPL Oct-2	ETION DATE 28-11	N2	13442	28.02	ATION (La 2 / E63							_	3	OLE 10	18R	
	NG CONT	RACTOR/DRILLE	R				TU TES		zomete	r										EVATION NAVD88)
ORILLIN	NG METH	IOD				DRILI	L RIG		LOTTICLE	•1										DIAMETER
		.5'), ROTARY(		5')			ling 1		/D=//.la.k								_	4.875		-101511017 55:
	ER 14PE (1-3/8")	(S) AND SIZE(S)	(ID)						PE/HAMI 0 lbs, 3			ор					- 1	AMME 68%	KEH	FICIENCY, ERI
BOREH	OLE BAC	CKFILL AND COM	IPLETION	I			UNDW DINGS	ATER	DURIN			3 A				(DATE				H OF BORING
iveat	cement	grout				INLAL			Not R	ecorde	d		N	ot Rec	oraea		1	165 ft		
Elevation (ft)	Depth (ft) Material Graphics			Description	1		Sample Location		Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Remarks/ Other Tests
00.75		medium; trac cementation;	(SM); brose fines; si [FILL].	ubangular	to dry; fine to GRAVEL; weak		<u>a 19900000000000000000000000000000000000</u>	5			60	60	40.1							Modified Proctor Max $\gamma_a$ = 127.4 pcf Optimum $W_i$ = 8.6%
			n mottling	; some fine	ard; brown with e SAND; low pla:	sticity;		02 5		5 31	18	18	54.8	10.1						Mud rotary set u at 6.5'; 4.875" drag bit
95.75	10	SILTY SAND with reddish I	(SM); de brown; so	 nse; grayis me SILT; t	sh brown interbe race fine GRAVI	 dded EL.	So	11.5		2 45	18	14	43.5	14.4						
90.75	15						So	04 15 16.5		7 37	18	15	48.8	11.8					<u>0000000000000000000000000000000000000</u>	
85.75	-20		continue	ed)																
				•					REPORT											OLE ID
									BORIN DIST.		ECO JNTY		RO	UTE	P	OSTN	ЛILE		S E	0018R A
	<b>A</b> C /	ALIFORI	ΔΙΜ	{	URS HMM	ARUP			PROJEC											
	וגיננו	h-Speed Rail	VIII/	rib:					Califor	nia H	igh-	Spe	ed T							1.
	пıgı	п-эрееа кан	AUTHO	rity	GALFORNA HO	H-SPEED	IRAN		BRIDGE	NUMBI	ER			RED B' ggi/T		rran		DA 2-	TE 20-1:	SHEET 2 1 of 9

	ECT NA		h-Speed Train Fresno to Bakersfield													- 1		T NUM 77-00	IBER	
LOGG	ED BY	a 1 11g	BEGIN DATE COMPLETION DATE Oct-27-11 Oct-28-11					TION (La 2 / E634								H	OLE ID			
DRILL	ING CO		ACTOR/DRILLER	IN-SIT	U T	EST	ING			. 1 10	۱۱) د	ialioi	iai G	iiu)		SI	JRFA	CE ELE	VATION	
	her/W .ING ME			DRILL	-	-	piez	zometer											IAVD88) AMETER	
			), ROTARY(6.5'-165')	Faili				PE/HAMN	ED ID								1.875		OIENOV ED:	
SPT	(1-3/8	3")	) AND SIZE(S) (ID)					) lbs, 30			ор					- 1	4101101E 88%	K EFFI	CIENCY, ERI	
	HOLE I		FILL AND COMPLETION rout	GROU READI			ΓER	DURING Not Re			6 A		DRIL ot Rec				OTAL 65 ft		OF BORING	
		<u>J</u>														<u> </u>				$\top$
		Material Graphics			ation	nper	th (ft)	.⊑ਂ	£	(ii)	_	(%	Moisture Content (%)	(%)	Plasticity Index (%)		Shear Strength (tsf)	ро <sub>4</sub>		
Elevation (ft)	(ft)	al Gra			e Loc	e Nur	e Dep	per 6	/lq) ər	ation	ery (ir	ash (	S e	Limit	ity Inc	ics (%	Stren	) Meth		
Elevai	Depth (ft)	Materi	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moistu	Liquid Limit (%)	Plastic	Organics (%)	Shear	Drilling Method Casing Depth	Remarks/ Other Tests	
	_20	Ī	20.0', grades medium dense; brown.			S05		4-6-9	15	18	12						0,	<del>/ -    </del>		Ŧ
					Δ		21.5					38	13.1							E
																		200		E
																		200		E
																				E
280.75	25		SILTY CLAY with SAND (CL-ML); hard; brown		$\forall$	S06	25	8-13-18	31	18	14							000000000000000000000000000000000000000		
	=		interbedded with grayish brown with reddish brown mottling; wet; little SAND; low plasticity.	'n	M		26.5					76.9	24.9	22	4					
							20.5											200		E
																				Ē
	=																			
275.75	30-																			
210.10	30 =		SILTY SAND (SM); medium dense; reddish brown fine to medium; some SILT.	n; wet;	M	S07	30	10-12-13	25	18	14	25.3								
					$\Box$		31.5					25.5								E
	=																			F
	<u>=</u>																	1000		
																				E
																				E
270.75	35		Poorly graded SAND with SILT (SP-SM); very der brown; wet; fine; few SILT.	 nse;	M	S08	35	26-27-27	54	18	15									F
	=		35.6', grades to grayish brown; fine to medium.		$\Lambda$		36.5					13.4								
																		000000000000000000000000000000000000000		
																				E
																		2000		E
270.75																				E
<b>-</b> 265.75	40-																			
			(continued)				[	REPORT T										ш	LE ID	
200.73							E	BORING	3 RE			DO	LITE	1.	0007	AII F		S	0018R	
	> 1	۸-	I I FODNII A TURS HMM A	ARL IP				DIST.		INTY			UTE		POST	/IILE		EA		
		JA ich	LIFORNIA Speed Rail Authority	-				ROJECT	ia Hi	gh-	Spe	ed T					1-		12::	
		ıgıı-	Speed Rull Authority	OPELIO TE	ALC: N		B	RIDGE N	UMBE	:R	PF   D	керағ . Ма	RED B ggi/T	Υ . Cι	ırran		DA 2-2	TE 20-12	SHEET 2 of 9	

	ECT N		h-Speed Train Fre	sno to Bakersfie	eld												- 1		77-00		
LOGG	ED BY	g	BEGIN DATE Oct-27-11	COMPLETION DAT	TE BORE				TION (La								Н	OLE II			
DRILL			ACTOR/DRILLER	30. 20 11	IN-SIT	U TE	ESTI	ING				- (1)		0	,		SI	JRFA	CE ELE	EVATION	
DRILL	ING MI	ETHO	)		DRILL	RIG	;		zometer											NAVD88) IAMETER	
			), ROTARY(6.5'-165 ) AND SIZE(S) (ID)	5')	Faili	_			PE/HAMM	NED ID	1							1.875		ICIENCY, ERI	
SPT	(1-3/8	3")			Auto	oma	itic,	140	) lbs, 30	O-incl	n dro	-					1	88%			
	HOLE t cem		FILL AND COMPLETION rout		GROU READ			ER	DURING Not Re			; A		DRIL ot Rec		(DATE	′ I	OTAL 165 ft		OF BORING	
														(%)							Т
ا ي		Material Graphics				ation	nber	Sample Depth (ft)	Ë	_ <del>⊊</del>	(in)	(ر	(%	Moisture Content (%)	(%)	(%) xəp	<u> </u>	Shear Strength (tsf)	por 4		
Elevation (ft)	(#)	al Gra				le Loc	e Nur	le Dep	per 6	le (bl/	ration	ery (ii	ash (	ıre Cc	Limit	ity In	ics (%	Strer	g Metho		
Eleva	Depth (ft)	Materi	С	Description		Sample Location	Sample Number	Samp	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moistu	Liquid Limit (%)	Plasticity Index	Organics (%)	Shear	Drilling Method Casing Depth	Remarks/ Other Tests	
	<b>-</b> 40	Ī	40.0', grades medium o				S09	40	8-12-13	25	18	13					J	0,	-		ŧ
						Δ		41.5					7.1	18.1							E
	Ξ																				Ė
	$\equiv$																				
	Ξ																				
	Ξ																				Ē
260.75	45		45.0', grades very dens	se.		Ms	S10	45	18-34-47	81	18	10									F
	Ξ					А		46.5					9.5	12.4							E
	Ξ																				F
	Ξ																				
	=																				
255.75	50-		SANDY SILT (ML); den		t little fine		S11	50	13-16-19	35	18	13							000000000000000000000000000000000000000		
	₫	ШЦ	SAND; weak cementati Poorly graded SAND (S	on		₩`			13-10-19	33	10	13	83.1								Ė
	$\equiv$		fine to medium; trace S	SILT; weak cementation	n.	П		51.5													E
	Ξ																				
	=																				
	Ξ																				
250.75																					
250.75	55-		Poorly graded SAND wi grayish brown; wet; fine			X	S12	55	14-18-19	37	18	8	11.1								E
	Ξ		cementation.					56.5													
	Ξ																				F
																					E
																			000000000000000000000000000000000000000		F
245.75	-60		(continue	nd)															$\simeq$		
			•	-					REPORT T		-00									DLE ID	
									BORINO DIST.		INTY		RO	UTE	F	POSTN	/ILE		EA	0018R	
	<b>(</b>	CA	LIFORNIA	URS HM	1M ARUP			P	ROJECT	OR B	RIDG	E N	AME_	· · · ·							
			Speed Rail Author	rity	NA HIGH-SPEED TO	RAN			Californ RIDGE N			PF	REPAF	RED B	Y			DA	TE	SHEET	
243.73		-										D	. Ma	ggi/T	Сu	ırran		2-	20-12	2 3 of 9	

	ECT NA		h-Speed Train Fres	no to Bakersfie	old														T NUN <b>77-00</b>	IBER	
LOGG	ED BY		BEGIN DATE Oct-27-11	COMPLETION DAT	TE BORE				TION (La 2 / E634								Н	OLE ID	)		
DRILL	ING CO		ACTOR/DRILLER	OCI-26-11	IN-SI				1 2032	+0308	7. 1 10	יו) כ	ialioi	iai G	iiu)		SI	JRFAC		VATION	
	her/W				Sta DRILI			piez	zomete	r										IAVD88) AMETER	
AUC	SER(0	'-6.5'	), ROTARY(6.5'-165'	)	Fail			00										1.875		AIVIETER	
	LER TY (1-3/8		AND SIZE(S) (ID)						PE/HAMN D lbs, 3			าต					- 1	AMME 88%	R EFFI	CIENCY, ERI	
BORE	HOLE I	BACKE	FILL AND COMPLETION		GRO	JND	WA <sup>-</sup>		DURING			-	FTER	DRIL	LING	(DATE	E) TO	OTAL I		OF BORING	
Nea	t cem	ent g	rout		READ	DING	iS		Not Re	ecorde	i I		N	ot Rec	orded	1	_   1	65 ft			$\overline{}$
		sjies				uo	e	(#)						Moisture Content (%)		(%) >		Shear Strength (tsf)			
n (ft)	æ	Material Graphics				Sample Location	Sample Number	Sample Depth (ft)	per 6 in.	(bl/ft)	Penetration (in)	(in) /	200 Wash (%)	Cont	Liquid Limit (%)	Plasticity Index (%)	(%)	rengtl	Drilling Method Casing Depth		
Elevation (ft)	Depth (ft)	erial				nple L	nple	nple [	ws be	N-Value (bl/ft)	etrati	Recovery (in)	Was	sture	jd Lir	sticity	Organics (%)	ar St	Drilling Metho Casing Depth	Remarks/	
Ele	-60	⊠at		escription		Sar	Sar		29-50	50/	12 Pe		200	Moi	Lig	Plag	Org	She	<del>/ -                                     </del>	Other Tests	$\perp$
	=		SILTY SAND (SM); very fine; some SILT; weak or	dense; reddish brow ementation.	n; wet;	X	\$13	60	29-50	5.5"	12	9	39	15.1					000000000000000000000000000000000000000		E
								61.5													
																					E
																					E
	=																		1000		E
																			000		E
240.75	65		Poorly graded SAND with			-	S14	65	15-22-50		18	8									
	Ξ		grayish brown; wet; fine cementation.	to medium; few SILT	; weak			66.5		11.5"			11.1	12.4					<u> </u>		E
	=							00.0											000		E
																					E
	=																				E
	Ξ																		200		E
	_ =																				
235.75	70	ПП	SILTY SAND (SM); very fine; little SILT; weak cer		n; wet;		S15	70	20-22-34	56	18	14									
	=		,			Δ		71.5					22.2	12.9					200		E
	∃																				E
	=																				E
	<u> </u>																				E
	=																				E
230.75	75		75.01	OII T		L	040	75	40.47.04	20	40	47									E
	=		75.0', grades dense; bro	wn; fine; some Sil i .	•	X	S16	75	13-17-21	38	18	17	32.9	13.5					200		E
						$\Lambda$		76.5													E
																			000000000000000000000000000000000000000		E
230.75	$\equiv$																		200		E
	=																				E
-225 75	$\equiv$																				
-225.75		434	(continued	<u> </u>																	
			Toolianded	<u>,                                      </u>					REPORT											LE ID_	
									BORIN DIST.	_	CO JNTY		RO	UTE	F	POSTN	ЛILE		S(	0018R	
(	<b>A</b> (	^^	LIFORNIA	URS HM	M ARUP				ROJECT												
			Speed Rail Authori	3	NA HIGH-SPEED	TRAN			Califorr	nia H	gh-	Spe	ed T		·/					OUEET	
7	"	'y	opeca kali Adilion	'7					RIDGE N	NUMBE	=K			RED B ggi/T		ırran		DA 2-2	те 20-12	SHEET 4 of 9	

PROJEC Califo			h-Speed Train Fres	no to Bakersfield															T NUM 7 <b>7-00</b>	IBER	
LOGGED A. Poli	) BY	ıng	BEGIN DATE Oct-27-11	COMPLETION DATE Oct-28-11					TION (Lat								Н	OLE 10	)		
DRILLING	G CO		CTOR/DRILLER	OCI-20-11	IN-SIT	U TI	EST	ING			. 1 10	, (1	ialioi	iai G	iiu)		SL	JRFAC	E ELE	VATION	
Pitche					Star		•	piez	cometer	-									•	IAVD88) AMETER	
AUGE	R(0'	-6.5'	), ROTARY(6.5'-165'	)	Faili	ng	150										4	1.875	in		
SAMPLE SPT(1			AND SIZE(S) (ID)						PE/HAMM Dibs, 30			р						AMME 38%	R EFFI	CIENCY, ERI	
	DLE B	ACKF	TILL AND COMPLETION		GROU			ER	DURING Not Re			i A		DRILI		(DATE			DEPTH	OF BORING	
Near	Jenne	nt gi	out						NOT RE	cordec			INC		orueu	_	<u> </u>	65 ft			$\top$
(#)		raphics				cation	umber	epth (ft)	per 6 in.	ol/ft)	n (in)	(in)	(%)	Moisture Content (%)	it (%)	Plasticity Index (%)	(%)	Shear Strength (tsf)	ethod		
Elevation (ft)	Depth (ft)	Material Graphics	D			Sample Location	Sample Number	Sample Depth (ft)	Blows per	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	loisture (	Liquid Limit (%)	lasticity I	Organics (%)	hear Stre	Drilling Method Casing Depth	Remarks/	
8	0	Σ	Poorly graded SAND wit				ഗ് S17	80	m 18-22-25	2 47	18	14	7	Σ	≔	<u> </u>	0	<u>w</u>	_	Other Tests	$\pm$
			grayish brown; wet; med cementation.	ium; few SILT; weak		Å		81.5					9.4	16.7					200000000000000000000000000000000000000		
			SANDY SILT (ML); hard SAND; weak cementatio		ne fine		S18	85 86.5	21-34-35	69	18	16	53.3	20.4					<u> </u>		
215.75 9	0-	Щ	SILT with SAND (ML); he SAND; weak cementation			M:	S19	90	19-27-37	64	18	14	84.9	30.2							
040.75			SANDY SILT (ML); hard mottling; wet; some fine	; brown with reddish brov				91.5					69.5	27.1							
210.75 9	15		SILTY SAND (SM); very medium; little SILT.	dense; brown; wet; fine	to	M	S20	95	24-31-43	74	18	12	23.8	13.5							E
210.75 9						<u>v V</u>		96.5													
			(continued	)																	
									EPORT 3		СО	RD								LE ID 0018R	
200.70-10			UE						IST.	COU				JTE	P	POSTN	/ILE		EA		
	) (	Αl	LIFORNIA	URS HMM /	ARUP			P	ROJECT Californ	or b ia Hi	RIDG gh-S	Spe	ed T								
	Hi	gh-	Speed Rail Author	CALIFORNIA HIC	SH-SPEED TE	MAS		В	RIDGE N	UMBE	R		REPAR			rran		DA <sup>2</sup>	TE 20-12	SHEET 5 of 9	

Calif	fornia		-Speed Train Fi BEGIN DATE	resno to Bakersfield COMPLETION DATE	PODELIO	15.	004	TION /I -	+/1	1 0 " N 1	orti- "	East	nd Dr	ti iba'				77-00	
A. Po	_		Oct-27-11	Oct-28-11	BOREHO N2134	428	3.022	1 / E634	0369	01 No 9.116	ortn/	⊨ਕst a latior	nal G	rid)		5		18R	
		NTRAC	TOR/DRILLER		IN-SITU T			rometer	-										EVATION NAVD88)
DRILLI	NG ME	THOD			DRILL RI	<del>.</del> G	-	JULIER										•	IAMETER
			ROTARY(6.5'-1	65')	Failing SPT HAM			DE/LIA \$ 45	ובט יר							_	1.875		ICIENOV ED.
SPT	(1-3/8	")	ND SIZE(S) (ID)		Autom	atic	, 140	) lbs, 30	O-incl	n dro	-					- (	68%		ICIENCY, ERI
		ACKFIL ent gro	L AND COMPLETIC	N	GROUND		TER	DURING Not Re			i A		DRIL ot Rec		(DATE		OTAL 165 ft		OF BORING
, toat	551116	Jin git	· ut					1400 130	.55, 460	_		14		Jiacu					
Elevation (ft)	S Depth (ft)	Material Graphics		Description	Sample Location		Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
			100.0', grades trace	organic material.	X	S21	100	36-50	50/ 5"	11	11	27.8	16.9			2.1			
200.75	105		105.0', grades fine; s	ome SILT.	X	S22	105 106.5	22-25-32	57	18	12	37						0.0000000000000000000000000000000000000	
95.75	1110		110.0', grades to gra	yish brown.	X		110 111.5	43-37-50	87/ 10.5"	17	14	38.1	17						
90.75	1115				X	S24	115 116.5	21-27-27	54	18	7							000000000000000000000000000000000000000	
85.75 <b>=</b>	120		(continu	ued)															
								EPORT ON THE			ВL								DLE ID 0018R
								IST.		JNTY	עט	RO	UTE	F	POSTN	/ILE		EA	
		CAL	IFORNIA peed Rail Auth	URS HMM	ARUP			ROJECT Californ					rain						
	H	igh-S	peed Rail Auth	ority GALFORNA HE	CH-SPEED TRAIN			RIDGE N					RED B	.,			DA		SHEET 6 of 9

	ECT NA		h-Speed Train Fresno to Bakersfield															T NUN					
LOGG	ED BY	a i iig	BEGIN DATE COMPLETION DATE Oct-27-11 Oct-28-11					TION (La 2 / E634								Н	131577-00 HOLE ID S0018R						
DRILL	ING CC		CTOR/DRILLER	IN-SIT	U T	EST	ING			,. 1 10	, (I)	ialiUl	iai G	iu <i>)</i>		SI	SURFACE ELEVATION						
	her/W			Stan		-	piez	zometer	•								305.75 ft (NAVD88)  BOREHOLE DIAMETER						
AUG	GER(0	'-6.5'	), ROTARY(6.5'-165')	Faili	ng	150											4.875 in						
	PLER Τ\ Γ(1-3/8		AND SIZE(S) (ID)	SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop GROUNDWATER DURING DRILLING AFTER DRILLING (DAT													HAMMER EFFICIENCY, ERI 68%						
BORE	HOLE	BACKE	FILL AND COMPLETION	GROU READI			ΓER				G A				(DATE	E) T(	OTAL		OF BORING				
Nea	t cem	ent g	out	KLADI	ING			Not Re	corde	i 		N	ot Rec	orded		1	65 ft	: 		$\overline{}$			
		hics			ion	er	(ft)			(ر			Moisture Content (%)	(9)	Plasticity Index (%)		Shear Strength (tsf)	ال					
on (ft)	æ	Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Con	Liquid Limit (%)	/ Inde	Organics (%)	treng	Drilling Method Casing Depth					
Elevation (ft)	Depth (ft)	iterial			mple	mple	mple	ws pe	/alue	netral	cover	o Was	isture	uid Li	sticity	ganics	ear S	Drilling N	Remarks/				
ă	120	 ∐∐∐	Description SANDY SILT (ML); hard; grayish brown with redo	lish		S25		8-16-40	56	18	10 10	20	ğ	ij	<u> </u>	ō	ည်	_	Other Tests	4			
			brown mottling; wet; some fine SAND; weak cementation.	21011	Å							57.4						000000000000000000000000000000000000000		-			
	<u>                                     </u>						121.5													Ė			
	=																			F			
	=																						
																				Ė			
180.75	125		SILTY SAND (SM); very dense; grayish brown; w medium; few SILT; weak cementation.	vet;	M	S26	125	23-30-42	72	18	9	16.6								Ē			
	=		medium, few Silli, weak cementation.				126.5					10.0								F			
	<b>1</b> 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1																			E			
																				Ē			
	=																			-			
175.75	130																						
			130' Grades fine. 130.2' Grades fine to medium.		M	S27	130	21-30-40	70	18	11	23.8	21.5										
							131.5																
	=																						
																				E			
																				Ē			
170.75	135		SANDY SILT (ML); hard; grayish brown; wet; son	 ne fine	M	S28	135	35-50	50/	10	10									Ė			
			to medium SAND; weak cementation.		А		136.5		4"			61.3	19.9					1000000000000000000000000000000000000					
							. 55.5													F			
																				Ī			
	=																						
																				Ė			
105.7-	=																						
165.75	140		(continued)																	_			
								REPORT :			ВU								DLE ID 0018R				
								IST.		INTY		RO	UTE	F	POSTN	ЛILE		EA					
		CA	LIFORNIA LIRS HMM	ARUP			P	ROJECT	OR B	RIDG	E N	AME_	·!										
	H	igh-	Speed Rail Authority	3H-SPEED TR	MAS			Californ RIDGE N			PF	REPAF	RED B	Y			DA	TE	SHEET				
		_	•								D	. Ma	ggi/T	. Cu	ırran		2-	20-12	7 of 9				

		CT N		gh-Speed Train Fresno to Bakersfield															T NUN		
LOC	GGE	ED BY		BEGIN DATE COMPLETION DATE Oct-27-11 Oct-28-11					TION (La 2 / E634								Н	OLE 10	)		
DRI	LLI	NG C		ACTOR/DRILLER	IN-SIT	U T	EST	ING				· (1\	iatiOf	iui U	. iu <i>)</i>		SI	JRFAC	E ELE	EVATION	
			/. Ste	ewart D	Star		-	piez	zometer	•									•	NAVD88) IAMETER	
				5'), ROTARY(6.5'-165')	Faili				PE/HAMM	IED IE								1.875		IOIENOV ED:	
SF	PT(	(1-3/	B")	S) AND SIZE(S) (ID)	Auto	oma	atic	, 140	0 lbs, 30	)-incl	n dro	-					(	4101101E 38%	KEFF	ICIENCY, ERI	
				FILL AND COMPLETION grout	GROL READ			ΓER	DURING Not Re			) A		DRILI ot Rec				OTAL I	DEPTH	OF BORING	
																					Τ
			phics			ation	per	th (ft)	Ë	æ	E)	(	(9)	Moisture Content (%)	(%)	Plasticity Index (%)		Shear Strength (tsf)	ᄝᆫ		
ion (ft		(#)	al Gra			e Loc	e Nun	e Dep	per 6 in.	e (bl/f	ation	əry (in	ash (9	o Co	Limit	ity Ind	%) sɔ	Streng	Meth Dept		
Elevation (ft)		Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Aoistu	Liquid Limit (%)	lastic	Organics (%)	hear	Drilling Method Casing Depth	Remarks/ Other Tests	
	+	140		SILTY SAND (SM); dense; brown; wet; fine to me some SILT; weak cementation.	dium;		S29			38	18	16	7	2		П.	0	0)		Other rests	ŧ
		=		SILT (ML); hard; grayish brown; wet; few SAND;		-[]		141.5	5				42.1						<u>0000000000000000000000000000000000000</u>		
		Ξ		cementation.	weak								85.1								E
		=																			
		Ξ																			E
		=																			E
160.7	75	145-		SILTY SAND (SM); dense; grayish brown; wet; fir		$\frac{1}{\sqrt{2}}$	S30	145	14-20-24	44	18	12									
		Ξ		some SILT; weak cementation.	,	$\mathbb{A}$							49.3	22.1							E
		Ξ						146.5													
		Ξ																			Ē
		Ξ																			E
455	,,,	150																			
155.7	/5	150		150.0', grades fine to medium-fine; little SILT.		M	S31	150	20-25-28	53	18	12	17.1	23.9						Drilling stops at 165'; 15' pocket	E
		Ξ				Н		151.5	5				.,	20.0						for PS logging	F
		=																	000		E
		_																	000000000000000000000000000000000000000		
		Ξ																			E
		Ξ																			E
150.7	75	155-																			
		Ξ																	<u> </u>		E
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150.ī		_																			E
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<b>-</b> 145.7	/5⊷	160-		(continued)																	
									REPORT :		 	ВD								DLE ID 0018R	
									DIST.		JNTY		ROI	JTE	F	POSTN	ИILE		EA		
[40.1		(	CA	LIFORNIA JURS HMM	ARUP			F	PROJECT	OR B	RIDO	E NA	AME_	roin							
V				Constant Autority	H-SPEED TO	RAN			Californ BRIDGE N			PF	REPAR	ED B	Y			DA	TΕ	SHEET	
<u> </u>												D	. Ма	ggi/T	<u>. Си</u>	ırran		2-2	20-12	8 of 9	

	ECT NA i <b>forni</b> a		h-Speed Train Fresno to Bakersfield	l														T NUN 7 <b>7-00</b>				
LOGG	ED BY	u i ng	BEGIN DATE COMPLETION DATE Oct-27-11 Oct-28-11	BORE				TION (La								Н	OLE II	)				
DRILL			ACTOR/DRILLER	N2134428.022 / E6340369.116 (National Grid) IN-SITU TESTING Standpipe piezometer														S0018R SURFACE ELEVATION				
	her/W					-	piez	zometer	•							_		05.75 ft (NAVD88)				
	ING ME SER(C		) ), ROTARY(6.5'-165')	DRILL Faili			00										BOREHOLE DIAMETER 4.875 in					
SAMP	LER T	YPE(S)	) AND SIZE(S) (ID)	SPT H	IAM	MEF	RTYF	PE/HAMN								H	AMME		ICIENCY, ERI			
	(1-3/8		FILL AND COMPLETION					DURING			-	FTER	DBII I	ING	(DATE		38% 3TAL	% AL DEPTH OF BORING				
	t cem			READ			ILK	Not Re			-		ot Rec		(DATE	′	165 ft					
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests			
	160																	000000000000000000000000000000000000000				
	170		Borehole terminated at a depth of 165.0' on 10/27/2011.  For corrosion test results, see Appendix E.  Soil moisture indicated as "wet" because SPT st became wet during retrieval through rotary meth drilling fluid. Soil moisture indication should not used as an indication of a potential phreatic surf free groundwater table.  See Borehole Log Legend for soil classification of and key to test data and sampler type.	od be ace or																		
							5	REPORT T	TITI F									нс	DLE ID			
							E	BORING	G RE		RD	D.C.		1 -	OOT:	AII =		S	0018R			
		~ A I		AFF				DIST.		JNTY			JTE	F	POSTN	/IILE		EA				
			LIFORNIA URS IHMMI	ARLIP			F	ROJECT	OR B	RIDG gh-S	E NA Spe	AME ed T	rain									
	H	ligh-	Speed Rail Authority	IGH-SPEED TO	RAN			RIDGE N			PF	REPAF	RED B		rro-		DA	TE 20-12	SHEET			
											$\perp \nu$	. Ma	yyı/ l	. UU	ıııan		2-	2U-12	9 of 9			

Cali LOGG	ECT NA fornia ED BY nt Coh	Hig	h-Speed Train Fresno to Bakersfield  BEGIN DATE COMPLETION DATE  Oct-21-11 Oct-21-11					TION (Lat								1 H	1315 OLE II 300	<b>77-0</b> 0				
DRILL		NTRA	CTOR/DRILLER	IN-SIT				L0041	∪ <del>-</del> 71.(	JUJ	(140	411-OI 10	.ı UII	ω <i>j</i>		SI	JRFA	CE EL	.EVATION	_		
DRILL	ING ME SER(0	THOE '-5'),		DRILL Faili	ng '	150		PE/HAMM	EB ID							B(	OREH 3.875	OLE I	NAVD88) DIAMETER FICIENCY, ERI			
SPT	(1-3/8	") `	, , , ,	Auto	ma	itic,	140	) lbs, 30	)-incl	dro	•					6	68%					
	HOLE E t ceme		FILL AND COMPLETION COUT	GROU READI			ER	DURING Not Re			; A	FTER N	DRIL ot Rec		(DATE		OTAL 51.5 f		H OF BORING			
Elevation (ft)	Depth (ft)	Material Graphics	Description		Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests			
287.53	5—		SILTY SAND (SM); medium dense; light brown; n fine; some SILT; weak cementation; [ALLUVIUM].		000000000000000	S01 S02	0 5	4-8-11	19	60	60	38.3		1			37		Modified Proctor: Max $\gamma_d$ = 123.4 pcf Optimum W <sub>i</sub> = 7.8%			
	=		SANDY SILT (ML); very stiff; gray; moist; some file	 ne	1		6.5					39.5	4.6						mud rotary	E		
	<u>_</u>	₩	SAND; low plasticity; weak to moderate cementati	ion. av			6.5	9-11-12	23	18	18	64.4		23	2			) <u>))()()</u>				
			seams; moist; fine; some SILT; weak cementation SILTY SAND (ML); medium dense; grayish brown		$\mathbb{N}$		8					43.3	4.5					) <u>))()()</u>		F		
			reddish brown staining; moist; fine; some fines; w cementation.  Poorly graded SAND (SP); medium dense; brown gray seams; wet; fine; trace fines; weak cementation.	eak / with		S04	8 9.5	2-5-7	12	18	12											
282.53	10		SILT (ML); stiff; grayish brown with reddish brown staining; wet; few SAND; low plasticity; weak	- $ -$	Ms	S05	9.5	6-6-6	12	18	15	88.1	17.9	23	3							
	=		cementation.  SANDY SILT (ML); stiff; brown with reddish brown, staining; wet; some fine SAND; weak cementation		/\ 1/18	S06	11	4-6-6	12	18	14	53.7	25.6									
	=		Poorly graded SAND with SILT (SP-SM); medium dense; brown with reddish brown staining; wet; fe		Å		12.5											1/ -				
1	=		SILT; weak cementation; micaceous.		V	S07	12.5	6-6-6	12	18	15									Ē		
1			Poorly graded SAND (SD): Jacobs gravital brown a				14					11.9						1000		Ė		
CHOK 7-B.GFJ AROT DO IN LIBRARY GLB ZIZULIZ	15		Poorly graded SAND (SP); loose; grayish brown v dark gray seams; wet; fine to medium; trace fines weak cementation.	ушт ;		S08	14 15.5	4-4-4	8	18	14	2.8	24.1					2000000000000000000000000000000000000				
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272 53	20																					
	0		(continued)																	_		
							E	REPORT T BORING DIST.	3 RE	CO		RO	UTE	F	POSTI	ИILE			OLE ID 80019R A			
		A	LIFORNIA URS HMM A	ARUP			P	ROJECT	OR B	RIDG	SE N	AME										
	Н	igh-	Speed Rail Authority	H-SPEED TH	IAN			RIDGE N			PF	REPAR . Ma	RED B		ırran		DA 2-2	TE 20-1	SHEET 2 1 of 3			

PROJEC			h-Speed Train Fresno to Bakersfield															T NUN 77-00				
LOGGE	D BY	Ū	BEGIN DATE COMPLETION DATE Oct-21-11 Oct-21-11		BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2125513.18 / E6341547.865 (National Grid)													131577-00 HOLE ID S0019R				
	IG CO	NTRA	CTOR/DRILLER	IN-SIT				L0341	347.0	303	(140	ationic	ai Gii	u)		SI	SURFACE ELEVATION 292.53 ft (NAVD88)					
DRILLIN	IG ME	THOE	)	DRILL													BOREHOLE DIAMETER					
			ROTARY(5'-51.5')  AND SIZE(S) (ID)	Faili				PE/HAMM	ED ID								3.875 in HAMMER EFFICIENCY, ERI					
SPT(1	1-3/8	")		Auto	oma	atic,	140	) lbs, 30	)-incl	n dro						6	68%					
BOREHO Neat of			TILL AND COMPLETION	GROL READ			ER	DURING Not Re			6 A		DRIL ot Rec		(DATE		OTAL 51.5 f		OF BORING			
IVCati	CCITIC	in gi	out					Not No	coracc					oraca	_					Т		
		hics			tion	Ser	(#) ر	<b>ر</b>		<u></u>			Moisture Content (%)	(%	(%) xa		Strength (tsf)	_ ام				
Elevation (ft)	£	Material Graphics			Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Con	Liquid Limit (%)	Plasticity Index	Organics (%)	treng	Drilling Method Casing Depth				
evatio	Depth (ft)	terial			mple	mple	mple	ws pe	/alue	netral	cover	) Was	isture	uid Li	sticity	ganics	Shear S	Drilling N Casing [	Remarks/			
<u> </u>	<u>م</u>	E	Description SILTY SAND (SM); medium dense; brown; wet; fi	no:		Suga Suga Suga Suga Suga Suga Suga Suga	Sa 20	음 14-11-9	20 20	18	16	700	Mo	Lig	- Fa	ő	ß	_	Other Tests	4		
	=		little SILT; weak cementation.	ne,	X			14-11-9	20	10	10	22.3	12.3					000000000000000000000000000000000000000		F		
	3				И		21.5						.2.0							F		
	=																			Ė		
	3																			E		
	$\exists$																			Ē		
267.53	25-																			E		
	∄		Poorly graded SAND with SILT (SP-SM); medium		M	S10	25.5	6-8-9	17	18	14											
	$\exists$		dense; grayish brown with dark gray seams; wet; trace fines; weak cementation.	tine;	$\Lambda$		27					5	20.5							F		
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	=																			Ė		
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	=																			Ē		
262.53	30		Poorly graded SAND with SILT (SP-SM); medium		$\mathbb{H}$	S11	30	8-10-26	36	18	15									-		
	∄		dense; grayish brown with dark gray seams; wet; medium; few SILT; weak cementation.		X		21 5					6.3	23.4									
	=		31.1', 2" layer; light gray; weak to medium cemen	tation.			31.5													Ė		
	$\exists$																					
	$\exists$																					
	=======================================																			F		
	<u> </u>																			Ē		
257.53	35		SILT with SAND (ML); hard; brown with reddish b	 rown	$\forall$	S12	35	19-18-18	36	18	17									Ė		
	3		staining; wet; few fine SAND; weak cementation. SILTY SAND (SM); dense; brown with reddish brown		- X		36.5					76.9										
	$\exists$		staining; wet; fine; some SILT; weak to moderate cementation.		$\mathcal{L}$		30.3					38.6								E		
	$\exists$																			F		
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	₫				Ш																	
	3				M	S13	39	11-15-16	31	18	10							000000000000000000000000000000000000000		F		
252.53	40		(continued)		Н							<u> </u>			<u> </u>	<u> </u>						
			(					REPORT 1											DLE ID_			
								BORINO DIST.		CO		RO	UTE	F	POSTN	ЛILE		SI EA	0019R			
	· (	١٨:	IFODNIA TURS HMM A	ARUP .																		
		~L	LIFORNIA Speed Rail Authority					ROJECT	ia Hi	gh-	Spe	ed T										
	П	gn-	Speed Kull Authority	BRIDGE NUMBER PREPARED BY DATE SHE								SHEET 2 of 3										

DRILLING CO Pitcher/W DRILLING M AUGER(U SAMPLER T SPT(1-3/6 BOREHOLE	nen ONTRA J. Bak ETHOL D'-5'), YPE(S) BACKF	ROTARY(5'-51.5') ) AND SIZE(S) (ID)	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2125513.18 / E6341547.865 (National Grid) IN-SITU TESTING  DRILL RIG Failing 1500  SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop  GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) READINGS Not Recorded Not Recorded																		
Elevation (ft)	Material Graphics	Description			Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf) 6.1	Drilling Method Casing Depth	Remarks/ Other Tests			
247.53 45		SANDY SILT (ML); hard; brown with reddish stair wet; some fine SAND.  Poorly graded SAND with SILT (SP-SM); medium dense; grayish brown with reddish brown staining fine; few SILT; weak cementation.			S14	41.5 45 46.5	11-12-14	26	18	16	9.3	23.2					000000000000000000000000000000000000000				
242.53 50		50.0', fine to medium.				50 51.5	14-13-16	29	18	15							000000000000000000000000000000000000000				
237.53 55		Borehole terminated at a depth of 51.5' on 10/21/. For corrosion test results, see Appendix E.  Soil moisture indicated as "wet" because SPT sar became wet during retrieval through rotary metho drilling fluid. Soil moisture indication should not b used as an indication of a potential phreatic surfa free groundwater table.  See Borehole Log Legend for soil classification chand key to test data and sampler type.	mples od ee ce or																		
-232.53—60 <del></del>							REPORT 1			DL								LE ID			
		LIFORNIA Speed Rail Authority	ARUP BH-SPEED TR	AN		P	BORING DIST. PROJECT Californ BRIDGE N	COL OR B ia Hi	RIDG gh-	SE NA	AME	RED B	Y	rran		DA 2-	EA	SHEET			